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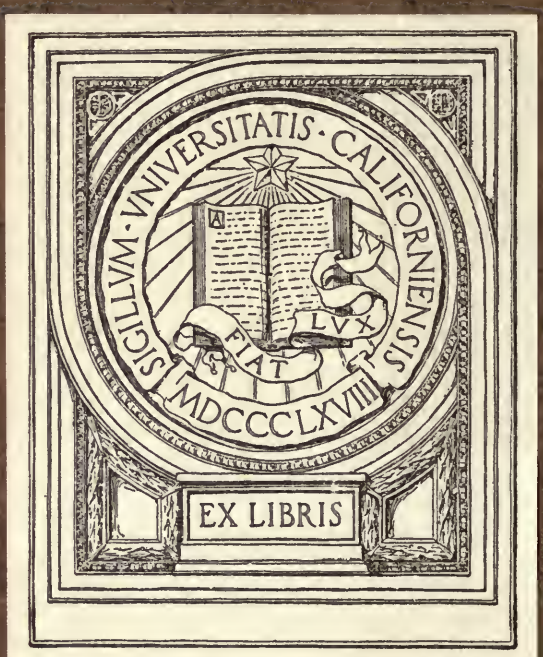

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THE WHALING EQUIPMENT OF THE MAKAH INDIANS

by
T. T. WATERMAN

SEATTLE, WASH.
PUBLISHED BY THE UNIVERSITY
1920

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INTRODUCTION

The present study was undertaken because of the presence for a time in the city of Seattle of a member of the Makah tribe, Mr. C. Peterson, of Neah Bay. Mr. Peterson is well informed concerning the life of his people, and has had for many years a certain intellectual interest in the details of primitive culture, especially with reference to his own group at Cape Flattery. The State Museum on the Campus of the University supplied the various objects described below; many of them being specimens collected by James G. Swan at Cape Flattery a number of years ago.

Several important printed works have appeared in the past, which deal with the material culture of the Makah or their close neighbors. These works are cited in detail in a terminal bibliography on page 50. The most recent of them is the famous series of volumes entitled "The North American Indian," by Edward C. Curtis. The eleventh volume of this great work, dealing specifically with the Nootka and the Haida, includes numerous notes on the tribe which is the subject of the present study. A much earlier work by another author, "The Indians of Cape Flattery," by James G. Swan, deals with a larger number of topics than does the book by Curtis, but in a more schematic way. Swan's system of transliterating Makah words is less accurate than Curtis' method. The most important paper on the primitive peoples of this region is a monograph by Franz Boas, "The Kwakiutl of Vancouver Island." This famous work contains descriptions of devices and processes, printed in the form of texts in the native Kwakiutl dialect. The present writer has not dealt in detail with any of those matters which are discussed by these earlier observers. Where Boas has described a process, for example that of separating spruce root into fibers, it seems unnecessary to go into that particular matter again. What he says of technological processes among the Kwakiutl is practically all applicable to the Makah. Boas' description is incomparable for the various manufactures and the detailed processes involved in them. Curtis' principal interest, on the other hand, is in ceremonies. His admirable account of the ceremonial practices performed in connection with whaling, as carried on by tribes adjacent to the Makah (such tribes as the Nootka, Quilliute, Quinault, and Kwakiutl), presents a very clear picture. What this author says of the ceremonial practices of neighboring tribes applies perfectly well to the Makah. Where the accounts of these previous writers overlap, their material is summarized and put in the form of an abstract.

The photographs illustrating the whaling industry are the work of Asahel Curtis, Esq., of Seattle, successor to the Romans Photo Company, and they are reproduced by arrangement with him. The line drawings were done by Sara Vinsonhaler of the Department of Design of the University of Washington.

Alphabet Used in Recording Indian Terms.—Many sounds occur in Makah which are not present in English. Swan[1] spells the Indian words as best he can with the ordinary English alphabet, with the result that the words as he gives them often do not sound like Makah. Curtis has a more complete set of symbols. His list does

[1] For authorities cited, see the terminal bibliography on p. 50

not, however, represent all of the Makah sounds. To describe the phonetic elements of this dialect seems to be somewhat troublesome; unless they are expounded in physiological terms which are of no interest to the casual reader. The usual resource on the part of authors who have to describe sounds such as these is to avoid "accurate" physiological terms, which seem uselessly difficult; using instead certain "general" terms, which, in most cases fail to convey any accurate idea of the sound as it is spoken by the Indian. The following notes may serve to give some impression of how the Makah words sound to the present writer. I think practically all of their spoken sounds are here represented.

VOWELS

i, ɪ u, ʊ

e, ɛ ʌ o, ɔ

a a

i, as in *machine* u, as in *rule*
ɪ, as in *pin* ʊ, as in *full*
e, as in *fête* o, as in *note*
ɛ, as in *met* ɔ, as *ou* in *ought*
a, as in *hat* a, as in *bar*
ʌ, as in *but*

DIPHTHONGS

ai, as in *aisle* oi, as in *boil*

SEMIVOWELS

w, y, substantially as in English

CONSONANTS

	Stop			*Labial-ized stop*		*Contin-uant*	*Affrica-tive*		*Nasal*	*Lateral*		*Affricative lateral*	
	Surd	*Sonant*	*Fortis*	*Surd*	*Fortis*	*Surd*	*Surd*	*Fortis*	*Sonant*	*Surd*	*Sonant*	*Surd*	*Fortis*
Labial	p	b	p'						m				
Dental	t	d	t'			s	ts	ts'	n	L	l	tL	tL'
Alveolar						c	tc	tc'					
Palatal	k	g	g'	kw	kw'	x							
Velar	q	γ	q'	qw	qw'	ξ.							
Glottal	'					h,'							

The consonants are sounded approximately as they are in English, except for the following:

Fortis Sounds—These are "exploded" or "cracked" consonants produced with the vocal organs in the position for the ordinary sound, but with hard pressure. The

release is very sudden but the rush of breath is slight. The combination produces a sharp sound, markedly different from anything in English. The sound itself is very brief, but the firm *"closure"* which precedes it is often prolonged. As indicated in the chart, these fortis sounds are of various types (*p, k, t,* etc.), and are of frequent occurrence. The symbol which represents them (namely, '), is explained below.

Labialized Stops—The nature of these sounds is indicated fairly well by the symbols chosen to represent them.

Continuant Sounds—The symbol *c* stands for a simple sound which is represented in English usage by a combination of two symbols, namely *s* and *h,* as in the English word *"she."* The *x* indicates a sound made by friction of the breath between the back part of the tongue and the palate, as in German *ach.* This sound resembles ordinary English *h,* except that the friction is more pronounced, the passage between the tongue and the palate being greatly narrowed.

Affricative Sounds—These consist essentially of a continuant preceded by, and "fused" with, a "stop." The symbol *ts* in Makah has approximately the value it has in English, the two elements being pronounced as one sound. I think the sound is more properly represented by one symbol, but no convenient symbol exists. As is *not* the case in English, this *ts* sound in Makah is very frequent at the beginning of words. The *tc* represents the combination of *t* with the *c* sound described above.

Lateral Sounds—One sound which does not exist in English, but which is extremely frequent in Makah, is represented by *L.* This sound has the same relation to ordinary *l* that English *p* has to English *b,* namely the organs are in the same position, but the vocal cords are not employed. Curtis represents the sound by a combination of *h* with *l.* This combination may give a distant hint of its effect on the ear.

Affricative-lateral Sounds—These have the same relation to the laterals that the ordinary affricatives have to the stops; the lateral affricative, namely, is a lateral which enters into combination with, and is "fused" with, a "stop" which precedes it.

Velar Sounds—These sounds, often described as "gutterals," are produced very much in the fashion of ordinary *k,* as it is in *kick,* but the contact is much further back in the mouth. A little practice enables an English-speaking person to produce these sounds without any difficulty. The "stop" is represented by *q,* and the corresponding continuant by γ.

Glottal Sounds—The most noteworthy of these is a "glottal stop" ('). Between vowels, this symbol indicates an interruption of the breath by a closure of the larynx, which closure is achieved by drawing the vocal cords completely across the passage. This is a commonplace action, performed, for example, in the process of coughing. When used in connection with consonants, this symbol represents a "stress" or "explosiveness," in which a glottal closure is probably one factor. The effect of this explosion produces on the ear a "cracking" of the consonant, which is very noticeable and striking in the speech of the native Indians.

NOTE.—The symbols used in the above tabulation are based on the report of the Committee of the American Anthropological Association on the phonetic transcription of Indian languages.[2] The sounds of Makah correspond, almost throughout, to the sounds of the Kwakiutl language as described by Boas in the opening pages of his monograph already mentioned. The sound which Boas describes as resembling *ky* and which he writes as *k*, I have written *ky;* and similarly with his *x*, etc. I heard both *s* and *c* in Makah, and also the affricatives, *ts* and *tc*, although in Kwakiutl only *s* and its affricative *ts* occur. What Boas says of the other sounds of Kwakiutl, seems to my ear to apply to the sounds of Makah. As with Kwawiutl, *t*, *d* and *s* are very far forward. In the language as spoken by Mr. Peterson, they were actually dental.

Other Symbols Employed—Prolongation of a vowel or consonant is indicated by (·), a period above the line. More pronounced prolongation is represented by a colon (:) following the symbol for the sound. A period between two vowels indicates that they do not form a diphthong. Long-continued and non-grammatical prolongation, as in rhetorical exclamations, is represented by +.

The symbol ^{u} indicates that the preceding consonant was pronounced with an *o* (or *u*) position of the mouth. Superior letters indicate in general whispered or weakly articulated sounds. The symbol (<) indicates the presumable derivation of a term; or marks the word with which a given expression is associated in the mind of the Indian. I am not sure of the etymological accuracy of all of these derivations. In many cases they are undoubtedly correct. In explaining the meaning of Indian terms, literal translations are preceded by (=).

Square brackets are used, as they are ordinarily, to mark the writer's editorial comments, where such comments are necessary.

[2] See "Report on the phonetic transcription of Indian languagts," in the bibliography on p. 50 below.

THE "CHINOOK" CANOE

Probably the most important factor in the whaling industry of the Makah is the canoe. They procure their food supplies for the most part from the open sea. In the latitude of Cape Flattery the Pacific Ocean is very boisterous, and good boats coupled with good seamanship are essential for a seafaring life. The hunting grounds for whales lie along the shore, and the great animals, especially certain species, sometimes come quite close in, but on the other hand the hunt often takes the Indians entirely out of sight of land. The halibut banks, also, which are the mainstay of their existence, and more important from the point of view of their food economy than is the killing of whales, lie from five to thirty miles off shore. Under these circumstances, specialization in matters connected with the canoe takes on the very highest importance. Better canoemen than the Makah have probably never existed. I learn also that their boats deserve the very highest place for staunch seaworthiness, coupled with great manageableness and speed.

The Makah use only one type of craft, the so-called "Chinook" canoe.

This type of canoe is a dugout, hewn, except for a superimposed bow and stern piece, from one cedar log. The particular model which is popularly spoken of as the "Chinook" canoe, is illustrated in Figure 2, *b*. The use of this model is characteristic of the whole of Puget Sound, and of a region stretching some distance to the north and south along the coast. I am not familiar with the exact limits of the area, but the Columbia River is included in it (Curtis, Vol. 8, Folio, Plate 265 shows that boats of this type are used by the Wishram, living at the great cascades of this stream). The use of this canoe characterizes the whole coast of Washington, and a large part of the west coast of Vancouver Island. The Nootka and Clayoquot, near Nootka Sound, use imposing specimens made along this model. In fact, there is evidence that this type of boat originated with them.[3] They manufacture a large number of the boats which are in use at the present day, and supply them to the tribes on Puget Sound and southward, either directly, or through the Makah. As pointed out by Swan,[4] the Makah themselves do not make canoes to any great extent, because their territory does not furnish the best cedar. They, however, depend upon the canoe for all purposes, including the winning of their livelihood. The "Chinook" type of canoe used by them in common with other tribes has never been adequately described, so it may appropriately be taken up in detail here. It is as much used by the Makah, and as skillfully handled, as by any tribe, even though they do not as a usual thing manufacture their own boats.

THE NAME "CHINOOK"

This word, "Chinook," holds a high place in the affections of the Northwest. Primarily the name of one small sub-tribe, living at the mouth of the Columbia River, it has become associated through historical accident not only with a type of canoe, but also with a certain "jargon language," and with a warm southwest wind. The

[3] Lewis, 1906, p. 163.
[4] 1870, p. 36.

wind does not concern us here; but the jargon language which passess commonly under the name "Chinook," is, like the canoe, the product primarily of the Nootka,[5] living on the west coast of Vancouver Island, many hundreds of miles to the north of Chinook territory. The term Chinook has long been in use, in connection with the "jargon," and the canoe, and I think this usage, in spite of its inaccuracy, deserves to be followed.

COMPARISON WITH CANOES OF OTHER PARTS OF THE PACIFIC COAST

There is a good deal of similarity in the dugout canoes used by the various tribes along the whole Pacific Coast, including the tribes of Southern Alaska, those of Northern California, and all the coast tribes in between. South of the Columbia River, however, Indian boats are not very large, nor are they at all seaworthy. They are built on what the northern Indians would call a "shovel-nose" model. The bottom, that is to say, is rounded in cross section, but somewhat flatter toward the bow and the stern, which are cut off square, as in the "punt" of civilized communities. These squared ends are crowned up in a sort of peak, to relieve their clumsy appearance, and among the California tribes a carven ornament rides upon the prow. Such boats are excellent for quiet water, and are quite speedy, but the Indian takes his life in his hands if he goes very far to sea in one of them. This is the type of craft which the great Vancouver mentions, in connection with his exploration at Port Orford, in Oregon, in the year 1792:

"Their canoes, calculated to carry about eight people, were rudely wrought out of a single tree; their shape much resembled that of a butcher's tray, and seemed very unfit for a sea voyage or any distant expedition."

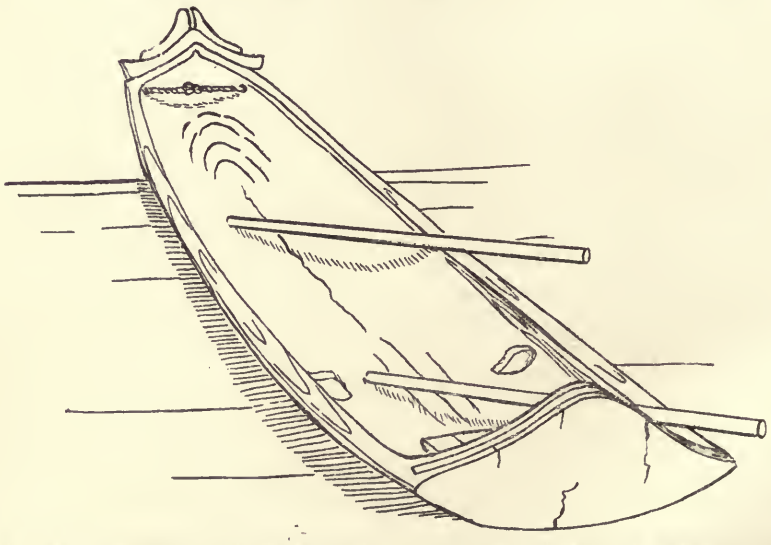


FIG. 1—Dugout canoe from Northern California (Yurok tribe), University of California, Museum of Anthropology, Catalog Number 1/1700. Length, 18 feet (5.99 meters).

[5] See Meany, 1907, p. 44.
[6] 1798, Vol. 1, p. 204.

This type of boat is the one used at the present time by the Yurok along the Klamath River, in Northern California, and by their neighbors. Figure 1 shows a characteristic Yurok specimen. This is exactly what we would expect to find, if a knowledge of navigation, and a specialized industry in canoe-making, had become gradually diffused southward from a center somewhere north of the Columbia River.

The same general type of craft is known along the coast of Washington, and a close relative is found among the tribes of British Columbia, but it is used only in navigating estuaries, rivers, sloughs, creeks and other quiet waters. In other words, as we go southward, the size of canoes diminishes and we find fewer models in use, until in northern California but one type, and that a relatively poor one, has survived.

The "Chinook" canoe is in many ways an excellent model. It is very large, is pointed at both ends, and carries lofty carved prow and stern pieces. It is perfectly "fit" for use on the high seas. On the eastern coast of Vancouver Island, and northward among the Indians of the British Columbia coast and Alaska, a slightly different type of canoe is in use. This northern craft differs enough in externals of design from the one last mentioned to be easily distinguishable. If we call the second the "Chinook" model, we may speak of this third type perhaps as the "Northern" model. These "Northern" canoes, of which the Haida make probably the best specimens, are very large in size, exceeding the "Chinook" specimens (though the latter in extreme cases reach a length of fifty feet or more). The northern boat is also more elaborately ornamented. The main differences in shape are that the northern model has a vertical cutwater, and an oblique stern, while the Chinook model has a sloping cutwater, and is vertical at the stern. These differences are illustrated in Figure 2.

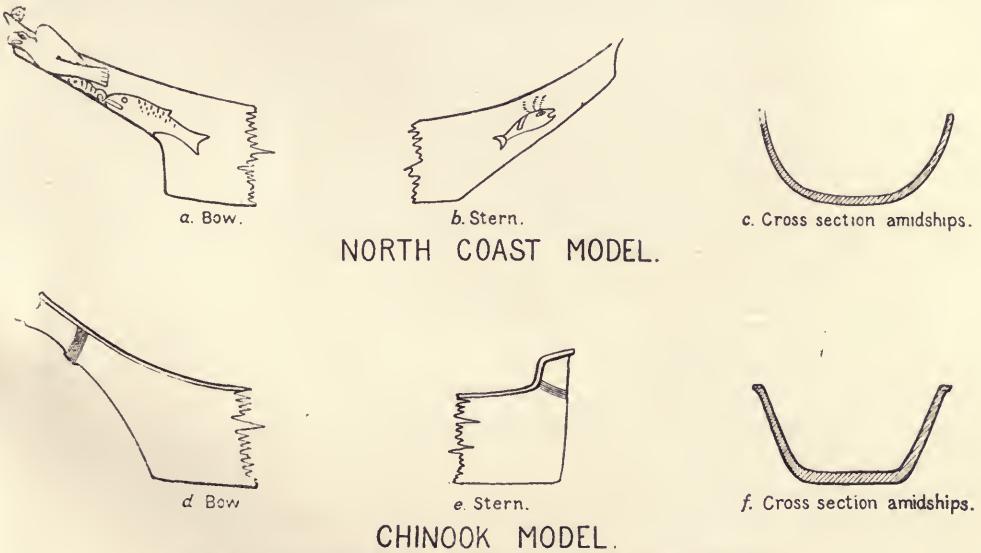


FIG. 2.—Two types of sea-going canoe found in the Pacific Northwest.

The "northern" model is drawn from a Haida specimen (University of Washington, State Museum, Accession No. 271); the "Chinook" model is from a miniature canoe made of alder, Makah tribe (Catalog Number 2658).

The difference just mentioned has been pointed out by previous writers. Niblack in Plate 34 of his "Coast Indians of Southern Alaska," illustrates it with a plate. In his drawing, however, he has turned his Haida boat end for end, placing the stern where the bow ought to be. This misrepresentation may be the error of his draftsman. Niblack's own remarks, however (on page 295 of his work), seem to indicate that the two ends of the boat are confused with each other in his memory. The bow of the Haida boat, as may be noticed in Figure 2 on this page, does at first glance seem to be designed for a stern. The best canoes in this Northwestern region, whether of the northern or the Chinook model, show an outward "flare" in the side just below the gunwale. The Makah boats exhibit this feature, and Curtis mentions it as characterizing the canoes of Puget Sound (Curtis, Vol. 9, p. 60). Its purpose is to keep waves from curling into the boat in rough weather. It hardly seems that so slight a protection could have much effect, yet I am assured that the presence of the flare makes the boat behave quite differently in a sea. The Makah say that the "northern" or Haida boats lack this feature. Niblack, on the other hand (p. 295 of his work), says that the northern models have it, while the Makah or "Chinook" specimens lack it. The truth very likely is that the use of this flare depends upon the skill of the individual carpenter. The only Haida canoe which I have had a chance to examine (a University of Washington specimen), did not have this feature. I doubt, however, in view of Niblack's remarks, that the lack of it is characteristic of any particular tribe. The "northern" boats, says Niblack, "have projecting prows, high, spur-shaped sterns, flaring gunwales, and a gracefully rounding or curving cross-section, although without any distinct keel. The latter have the blunt, straight stern, a gracefully curving bow, but a flat bottom, with little curve in the cross-section." This type is "heavier, roomier, stronger, less cranky, and more durable than the Haida type, but the latter is swifter, handier, and more buoyant." The present writer's Makah informant says that the Haida canoe is not so "dry" as the Makah boat, nor is the Haida boat, they say, so easy to handle. The Makah canoe ships no water except in the wildest weather, and is even then easily kept free with a bailer (for this ingenius utensil see below page 27). The Haida canoe, possibly on account of its high stern, is said to be particularly good in a following sea.

"RATING" OF CANOES

As remarked above, most of the tribes of the Pacific Northwest have various styles of craft, for use under special circumstances. For example, they often have flat-bottomed and blunt-nosed canoes for use in still waters, and along creeks and rivers. The Makah spend their time in the turbulent waters around their cape, and use their sharp-nosed sea-going Chinook canoes practically to the exclusion of everything else. The only variant is a small wide boat, "with a stern at both ends," which is used by young people before they can be trusted to handle the big canoes. They use, however, various sizes of canoes. The general term for canoe is tc'Δ'p.Δts (Chap-ats, in the notation given by Swan). Niblack mentions four ratings as generally recognized among the Indians[7]: (1) Hunting and fishing canoes, (2) family

[7] 1888, p. 294.

and transportation canoes, (3) voyaging canoes, and (4) war canoes. Swan[8] groups the canoes of the Makah into four classes. The spelling and accent of the native terms for these ratings differ on different pages of this work. They are as follows:

(1) The whaling canoe, pa-dau-t'hl (p. 21), pah-dow-thl (p. 95); (2) the canoe for six persons, bo-kwis-tat (p. 21), bó-kwis-tat (p. 95); (3) a smaller canoe, a-tlis-tat (p. 21), ar-tlís-tat (p. 95); (4) a very small canoe used for fishing, ta-ka-aú-da (p. 21), ta-kaów-dah (p. 95).

Note.—Swan's pa-dau-t'hl is probably pada′wɪL,=outfit, or equipment. The term probably refers to the equipment of floats, lines, tow-ropes, and harpoons, with which the whaling canoe is laden. His term for the second type, bó-kwis-tat, is explained by my informant as bu-kyɪ′st, bu = four, kyɪst = inside. It would seem to be properly a descriptive expression for canoes carrying four persons, not six. His term a-tlís-tat, I cannot identify. His term for the "very small canoe," "te-ka-aú-da, is apparently tɛk'eodi′yɑk (= in the middle one sits). The craft was so small that one could not sit in the stern without capsizing.

Curtis mentions two sorts of canoes, the whaling canoe, "oo′tahsets," and the war canoe, "wi-tuk-ests."

According to my informant there are seven "ratings" as follows:

The "freight" canoe, cɪ'tLats. This craft is the largest made. Such canoes are employed when people are moving their effects from one locality to another. In some cases even the house timbers are loaded into the canoe, or towed along behind. Occasionally two or three canoes are lashed side by side, and the house planks laid across them to make a platform, spaces being left between the planks to accommodate the paddlers. The Makah do not often resort to this device. If a squall comes up the lashings have to be cast off, or the canoes soon fill.

The "war" canoe, witΔ′ksΔts (tΔkwi′dɑk—war). This is given by Curtis (Vol. 11, p. 179) as wi-tuk-ests. The craft is also known as the tLe′iks (= expedition, or errand, boat). It is somewhat smaller than the preceding, and has much less width of beam, in proportion to its length. It is used in warfare, for making ceremonial visits, in connection with marriages and feasts, and is employed for all extended trips. Canoes of this kind combine seaworthiness with speed, but could not carry much cargo without great inconvenience.

The "whaling" canoe. The bottom of this craft is 41½ "stretches" of the builder's arms in length.

The "three people" canoe, atLΔ′kwodiyɑk. This term is said to be descriptive of the position of the men in the canoe, namely, two men forward, paddling, with a steersman in the sternsheets.

The "sealing" canoe, yɛ′cabΔqΔts ("for two men"). In pursuing the seal, one man paddled while the other planted himself in the bow with the harpoon in readiness. This general method is the one employed by civilized sealers at the present, each boat carrying a "boat-puller," and a "hunter," the latter with a rifle. The sealing canoe is carefully designed so that it does not splash the water as it surmounts the waves. It carries a "knife-blade" at each end, which cuts the water (see

[8] 1870, pp. 21, 95.

below page 19. The seal are very alert and a boat which squatters over the swells causes them to take alarm. This canoe measures along the bottom 3½ "stretches" of the arms, from tip to tip of the fingers.

The "one man" canoe, tɛk'eodi'yak (=in the middle one sits). This is mentioned in the note above. It accomodates one person only.

The "children's canoe," hupi'dowac (<hu'pɛd — salmon-trout). This craft is small and, as the Indians say, "has a stern at both ends." In other words, both stern and bow are finished off with a carven piece like the one represented in Figure 1. This boat is paddled about by children, for practice.

THE HULL OF THE CANOE

Features of the hull described by other writers

NOTE.—Fairly complete accounts of the splitting out and hollowing of the canoe are given both by Swan and Niblack. Swan's especially is an excellent description, in outline. Niblack's account concerns primarily the Coast Indians of Southern Alaska and British Columbia, but what he says applies in large part to the Makah also. This description is not as full as the preceding one.

Curtis' passages on this matter add little to the ones previously written. This author does not seem as a rule to be much interested in technological processes.

A very full description of the shaping of a canoe hull, a description which is admirable in every way, and extremely graphic, is the one by Boas (Vol. 5, Part 2, 1909, pp. 344-369). This is a remarkable account, in Kwakiutl and English, of all the operations of canoe-making, including the ceremonial observances connected with it.

The Felling of the Timber of the Canoe—A cedar tree for canoe-making is selected with elaborate care, holes being bored to test its soundness (Boas, p. 344). It is felled near a water-way (Niblack, p. 297). The carpenter "makes it fall" on a favorable spot by throwing chips there; and he calls a warning to the tree, when he hears the wood cracking, to go down gently (Boas, p. 344).

Shaping of the Hull—The log is cut to the length required for the canoe by the use of mauls and wedges. The sap wood is split off, and the top side of the log is removed slab by slab to the level of the gunwales. Then the section of log is turned over and the bottom of the canoe hewn out. Then it is reversed again and the interior removed in slabs. When roughly shaped it is towed home and turned bottom side up, to receive the final finish (Boas, 19, pp. 344-346; Swan, 1870, pp. 35, 36; Niblack, 1888, p. 297).

The different sections are adzed out in regularly prescribed order (Boas, 1909, pp. 359-369; Figure 63, on p. 349 of his work). The thickness of the sides of the canoe is one finger's width near the top, one and one-half finger's width midway of the side, and two fingers' width at the bottom (Boas, p. 363).

Designing—The proper length for canoes for different purposes is established by tribal custom (Boas, p. 350), and is measured by fathoms (a fathom being the "reach" of the maker, the widest stretch of his arms). The curves of the canoe are made entirely by the eye (Swan, p. 36). The thickness of the sides is gauged by placing one hand on the inside, the other on the outside and passing them over the work (Swan, p. 36), or by drilling, here and there, numerous small holes, which are later plugged with cedar pegs (Boas, p. 360).

Tools—The instruments consist of hand-adzes, long-handled adzes (both with blades of stone), wedges of yew-wood bound with cedar withes to prevent splitting,

mauls of stone (Niblack, p. 297), bone drills, polishing materials, and chisels of mussel-shell (Swan, p. 36).

A complete account of each of these tools is given by Boas, pp. 319-327.

Widening the Canoe—When the log is small, the sides of the canoe are widened out with the aid of heat (Swan, p. 36). Fresh water is poured into the canoe to the depth of four fingers. Into this, red-hot stones are dropped, by means of tongs. When the water is hot, it is sprinkled all over the inner surface of the sides with a bailer (Boas, pp. 364-366). The outside of the hull is warmed by nearby fires of bark (Swan, p. 36; Curtis, Vol. 9, p. 60) or by scorching with cedar splints (Boas, p. 366). When the wood is "heated through," special struts of plank are placed crosswise in the hull, and pounded home with a maul. This spreads the sides of the canoe, in some cases as much as ten inches or a foot. Permanent thwarts are then lashed into place (Boas, p. 366-367; see below, page 21).

Bow and Stern Pieces—The characteristic feature in the canoes of the Northwest are bold and striking bows and sterns. These consist of separate pieces, hewn out of logs and joined to the hull by dowells and lashings (Curtis, Vol. 9, p. 60; Swan, p. 36). The joining of these additional parts to the hull is so close and well done that they are water tight without caulking. This careful fitting is accomplished by rubbing the hull where the extra piece is to be fitted on with grease and charcoal. The bow-piece is then seated exactly in place. When removed, those parts, which have been blackened by contact with the opposite surface, are adzed down, and the process is repeated until the bow-piece fits smoothly along its whole length (Swan, p. 37).

Thwarts—These consist among the Makah of round poles (Swan, p. 36). Among the Kwawiutl they are narrow planks, three fingers wide with a thickness of one finger (Boas, p. 366). Among the Makah they are fastened in place with cedar withes, which pass through perforations in the side of the boat (Swan, p. 36; Curtis, Vol. 9, p. 60). For the details, see p. 21 below.

Taboos—Boas mentions the following rules observed by the canoe-builder: He avoids contact with the opposite sex (p. 344); otherwise he finds rotten places in the wood from which he is shaping the hull. He does not comb his hair (p. 345); otherwise the ends of his canoe become split. Also, he does not permit anybody to look when he is heating the hull and spreading the sides (p. 347); for that may cause the canoe to split open. Similar rules are scrupulously observed by the Makah.

Paint—The inside of the canoe is colored with a "paint" composed of fish-oil, or seal-oil, and ochre, or "Indian red" (Swan, p. 37). This red ochre is obtained from a deposit in the territory of the Quilliute tribe, along the Quilliute River (Swan, p. 17). Sometimes charcoal is mixed with oil and rubbed on the outside of the hull. More commonly the hull is charred or scorched with lighted cedar splits, as described below (page 22; Swan, p. 37). Blue clay instead of ochre seems to have been used in the Puget Sound region (Curtis, Vol. 9, p. 61).

Carving—On the flat surface at the tip of the bow-piece, transverse grooves are gouged, to make an ornamental pattern of parallel lines. (See Figure 4 below, p. 17). Sometimes a pair of large round holes are cut through the bow-piece just below the tip (Niblack, Plate 34, upper figure, represents this feature). A square-looking ornament, carved in relief, may be seen on the bow of most canoes some distance down on the neck (inaccurately indicated by Plate 34 of Niblick and Figure 18 of Swan; various plates of Curtis' work also show this ornament). The prow terminates in a carving which, according to Boas (p. 444), resembles a bird's nest, but according to Curtis "has an accidental resemblance to a dog's head" (Vol. 9, p. 60). The form of carving is fixed by custom, but has no symbolic meaning.

Similar incised lines are found in the "throat" of the prow, and on the stern-piece; the parallel incised lines of carving are carried from bow to stern along the inside of the canoe, below the gunwale. [Something similar to this is mentioned by Curtis, Vol. 9, p. 60.]

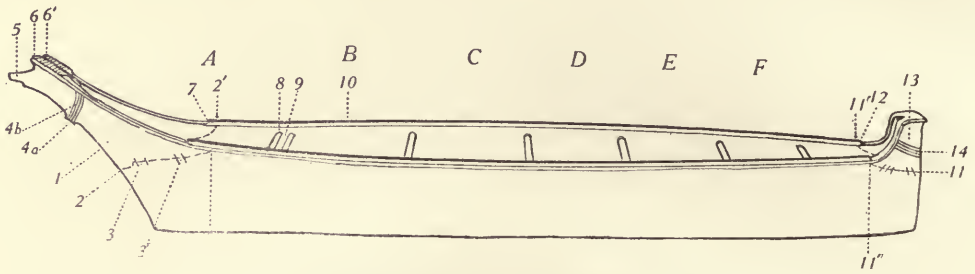


FIG. 3—Diagram showing the nomenclature of the canoe.

Parts of the hull

1. Carved bow-piece, kwΔqu'b (=sits at the bow).
2, 22. Joint, or "scarf," where the prow is joined to the hull (tabi'ᵛq^{w}).
3, 3. Perforations, connected by transverse grooves, which accommodate the necessary lashings.
4*a*. Projecting ornament, q'ada'do (=uvula).
4*b*. Incised ornamentation consisting of parallel lines, tsu'tsu (=scratches).
5. Forward projection of the prow, lɛ'kw'ɪLtΔb (=tongue stiking out).
6, 6. Tip ends of the gunwales, ɬhi'qaΔL (=ears).
12. After-end of the gunwale strip.
8. A thwart, tap'ab (=brace).
9. Space between the forward pair of thwarts, tL'asu'b—Δts (=mast-holder).
10. Gunwale-strip, tL'e'ɪxats (=paddle-piece).
11, 11', 11''. Joint, or scarf, where the stern-piece is fastened to the hull.
12. After-end of the gun-wale strip.
13. Carven stern-piece, kwa'a'ktLɪb (=sitting at the stern).
14. Incised ornamentation resembling 4*b*.

Names for the "spaces" between the thwarts

A. hitΔ'kwΔd (Swan, pp. 21, 95, he-tuk-wad, hey-tuks-wad).
B. kaqai'yuwaxs (Swan, *loc.cit* ka-kai-woks, *kah-kai-woks*).
C. tc'ɛL-'kduwΔxs (Swan, *loc.cit.* cha-t'hluk-dos, chah,-thlik-do-as).
D. .....
E. hitΔ'kstΔxs (=inside place).
F. tL'i'tca (=stern).

ADDITIONAL NOTES ON THE HULL

Bow and Stern Pieces

When the canoe is small, the whole hull is carved from one piece. In the craft of greater size, large additional pieces, called in general si'kwΔb="sitting pieces" (<kwa·sa=to sit), are fastened on to the hull. These added sections are designed with great elegance, and, as described by Swan (p. 36), are fitted to the canoe with exquisite care. The bow-piece, kwΔqu'b, is rough-hewn from a cedar log, to the

proper dimensions. On the hull a "scarf," tabi'dvq^{w} (="joint") is prepared, into which the bow-piece exactly fits. In some cases shoulders in this scarf prevent the bow-piece from slipping when it is once in place. In other cases a large curving socket is cut in the bow of the boat, and the bow-piece carved so as to fit in. Plate 1,*b*, shows a carpenter fitting such a bow-piece on his boat. Holes are drilled into the edges of both elements, carefully matched as to position. Cedar pegs or "dowells," tLΔ'p'ιqΔb (<tL'tla'pa = to hammer) are then used to fasten the two together. The work is so well done that the hull and the additions to it seem to be all in one piece. The "auger" for boring holes consists of a bone blade set in a handle and twirled between the palms. This drill is described and figured by Boas (p. 323 of his work).

These bow and stern pieces are very carefully designed with a view to artistic effect. They add very markedly to the gracefulness of the boat. Moreover, they carry out and round off the lines of the hull, and lend a very "finished" effect. The flat gunwales of the canoe are carried or "lifted" to meet the top of the bow piece, producing a fine sweeping curve, and are cut off square at their extremity. What seems to be a notch between them, Figure 5, *b*, and as seen in Plate 1, *b*, is really a trench or groove. This trench is in origin a continuation of the floor of the canoe, which becomes V-shaped at the bow and rises up to meet the gunwales. The corners

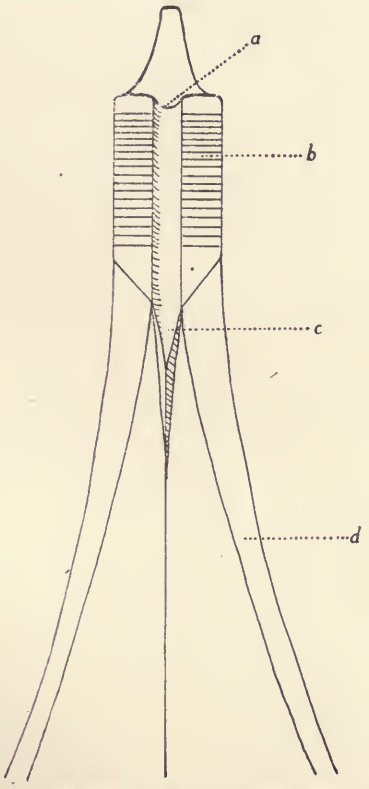


FIG. 4—Diagram showing the prow of the Chinook canoe, viewed from above.

a, notch where the point of the harpoon rests; *b*, the scratch ornamentation; *c*, the tongue, or wedge-shaped projection; *d*, the gunwale.

of the projecting prow are called the ɬhi'qabΔL, (=the edge or margin of a person's ear). The harpoon point rests in this notch when the Indians are after whale or porpoise. Perhaps the most striking element in the prow is a carven "snout," which projects out in front of the "ears." It is called lɛ'kw'íLtΔb, "tongue sticking out" (<lɛka:'ɬk = "tongue"); and gives the prow exactly the appearance of an animal's head. The Indians say that this carving represents nothing at all, and is merely "for looks." The life-like "effect" of the ornamentation is increased by the "cock" of the prow, the whole canoe having an air of alertness, as though it were alive and moving of its own accord. The Indian's consciousness of the canoe as an artistic whole, and his anxiety for effect, is shown by the carving of the projecting ornamentation which is visible on the neck of the canoe, some distance below the snout. It is called q'ada'ds, "uvula" (the organ which projects downward from the soft palate, in the back of the mouth cavity). The Indians say that the boat "looks bad," unless there is something at this point to break the line of the prow. The loving care they expend on the making of the canoe is also shown by a decoration consisting of lightly incised lines. Across the flat surface leading back from the "ears" is an ornamentation consisting of parallel grooves, called tsu'tstsu (<tsuts = scratch: tsu = to finish off). This "scratch ornamentation" is shown in Figure 4.

Where the longitudinal groove begins to widen out to make the body of the boat, a wedge-shaped tongue (Figure 4, *c*) is invariably carved. This again is merely "to give finish." From this tongue, horizontal grooves called tsu'tsi.i'dΔb (tsuts = to scratch; i'dΔb = gunwale), extend along the inside of the boat just below the gunwale, clear to the stern. They are purely for ornament, but like the other features, are found in this same unvarying form in all good canoes. This ornamentation is made with a special tool resembling a reamer.

The stern-piece, kwa'a'ktLɬb (= sits on the stern), is not so large as the bow-piece, nor (as might perhaps be expected) is it so elaborately ornamented. But it is most appropriately designed to "fit" its place, and merges admirably into the general design of the canoe. I do not see how anything could better illustrate the Indian's eye for effect than the care taken in designing this modest and inconspicuous stern-post. Like the bow-piece, it is painstakingly carpentered, and dowelled and lashed into place.

When the boat needs mending, sections of plank or patches are set into the side. Such an inset or patch is called qwΔb, or tL'as''i (<tLa'sak=an addition). Old boats are likely to be much patched, as the result of the weathering and cracking of the wood, and hard usage.

I have tried to indicate my sense of the artistic skill shown in the designing of these "sitting pieces." It must be borne in mind that their purpose is, nevertheless, primarily not aesthetic. The upreared bow-piece is put there to throw aside the seas into which the canoe is driven. If it were not there, every sea which the boat encountered would come right aboard. The stern-piece has a similar function and increases the seaworthiness of the boat tremendously. The bow-piece is much the larger of the two for obvious reasons, since the boat rides a following sea much more easily than the seas which are met solidly, head-on. In beaching a canoe, the Makah

always ride in stern-foremost. I think this is on account of the fine protection against heavy seas that is afforded by the bow. Both bow and stern-pieces are so slender that they hardly seem adequate to keep off the seas (see Figure 5, *b*). They have probably been reduced, as the result of long usage, to the slenderest design which will fulfill the purpose. Yet even in their present form they are highly useful. I dare say that their reduction to their present slender proportions has been equally for the artistic effect of delicacy, and for the practical consideration of reducing the total weight of the boat. The Indians have reached in this feature of the canoe what seems to my mind the highest artistic success, the making of what is a commonplace and practical contrivance, also artistically beautiful.

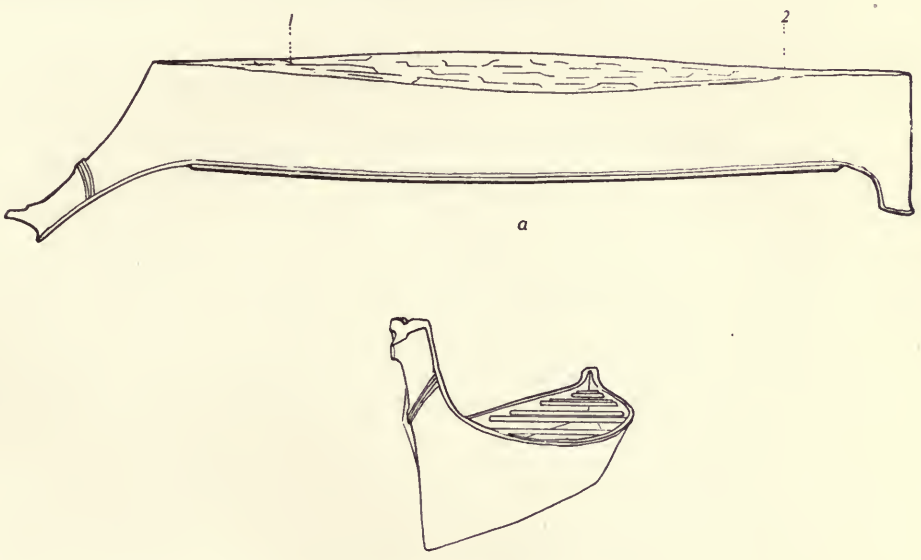


FIG. 5—The shape of the "Chinook" canoe.

a, the hull below the water line; *b*, the appearance of the canoe from in front. At points Nos. 1 and 2 in the upper figure the bottom narrows into a sort of knife-blade.

THE SHAPE OF THE HULL

The under side of the boat (Fig. 5, *a*) has some interesting features, from the standpoint of design. From the point marked 1 and 2 in the diagram (Fig. 5, *a*) the bottom of the boat narrows and at the same time protrudes slightly, producing a sort of keel at bow and stern. The narrow part rides somewhat lower in the water than the rest of the bottom. A "blade" of this sort at bow or stern is called sɨp·u′s (<si′ap = anything elongated and crested). It has a very practical purpose. In hunting sea-mammals, especially the seal and the otter, great silence is necessary. A ship's boat, even one of the better designed ones, when it surmounts a wave and dips forward is likely to slap the surface of the water. This noise often alarms the quarry. Seals are frequently found napping in the water, turned on their backs or their sides, with the hind flippers turned forward and up, breathing

peacefully as their heads emerge from the waves. The Indian canoe can approach much more silently than the white man's boat, for this knife-blade at bow or stern cuts the water, instead of pounding down into it. The seal canoe has conspicuous "knife-blades" at both bow and stern, to prevent any splashing which might result from the pitching of the boat in the seas.

The Chinook canoe has a rather flat bottom, as pointed out by a previous writer (*b*, Fig. 2, p. 11 above). The terms for the various parts of the inside of the hull are shown in the following diagram (Fig. 6):

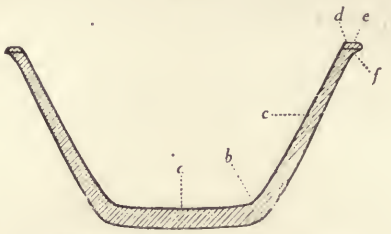


FIG. 6—Diagram showing the cross-section of a canoe.

a. hitΔ'ktΔk, bottom.
b. tL^{3}Δtc, curve at the side (<tL'ΔtcΔk = to fold).
c. hitΔ'tsk, side.
d. hitΔkwi'i, along the top of the gunwale.
e. tL'e'ιxats, gunwale-strip (<tLi'^{o}xΔk = to paddle).
f. di'tLki''i, out-turn of the side, just at the gunwale.

INTERIOR FITTINGS

The canoe has no ribs or knees, "holding up" merely by the strength of the solid hull. Along the top of the gunwale lies a gunwale-strip, tL'e'ιxats (meaning "against it one works the paddle"). This is a thin strip of plank some three inches wide, extending from stem to stern of the boat. This plank is fastened down with cedar pegs. Its purpose is to prevent the sides from being worn down by the rubbing of the paddles as the boat is propelled. When this strip becomes worn, it is easily replaced by a new one. The thwarts are called ta'p·ab, "bracers" or "spreaders" (<ta = to brace). This term arises from the custom of spreading a canoe artificially by means of heat as described above in the quotations from Swan and Boas. Special struts, ta'ktup (<taktc=to push with a pole) were used for the actual work of prying the canoe open. The thwarts get the name "spreaders" because they were fitted in as though to keep the sides from closing together again. The word "spreaders" is in general use for thwarts, although this "spreading" was done only in special cases. The fitting of the thwarts is done as follows: Round pieces of the proper length are cut, and each end is worked down into a sort of dowell, suptsu'watιts. One hole is drilled horizontally through the thwart, and two pairs of smaller holes through the side of the canoe (Fig. 7), one pair above the other. A withe made of cedar limb is soaked to make it soft. It is first rove through the thwart, is then passed outward through the side of the boat, and back

through another perforation, then through the thwart again, and so on, by the method shown in Fig. 7, until the thwart is firmly bound in place. The remainder of the withe is served around the dowell. Both ends being caught beneath the lashing, the whole is very solid and presents moreover a very workmanlike appearance. The lashings neatly fill in over the more slender part of the thwart, and give the whole a very smooth and finished effect.

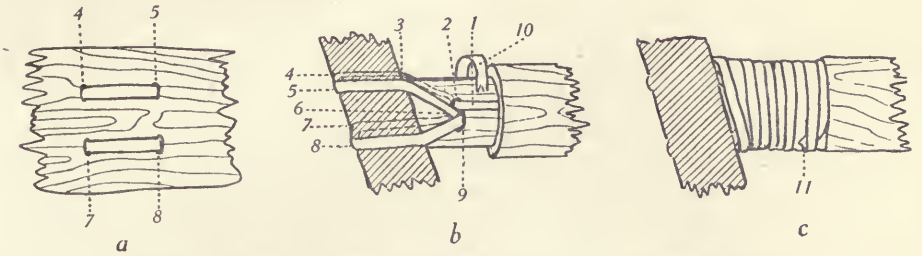


FIG. 7—Diagram showing the lashing which holds the thwarts in place.

a, A section from the outside of the boat, showing the appearance of the two turns of lashing seen from the outside. *b*, Diagram showing how the lashings are applied. The strip is laid along the thwart, beginning at 1, goes through the thwart at 2, enters a hole through the side of the boat at 3, emerges on the outside of the hull at 4, starts inward through a hole at 5, enters the hole through the thwart at 6, passes through the hull again at 7, returning at 8, passes through the thwart at 9, emerges on the far side, and begins to wrap around it as at 10. *c*, diagram of a cross-section of the side of the boat, showing the thwart and the finished wrapping, with the end caught under a turn at 11.

The manufacture of these cedar withes or lashings is described by Boas (p. 375) and will be referred to later in the present paper under the heading of ropes and lines.

On the floor of the boat are other fittings. Forward in the boat, just below the pair of thwarts at the bow, is a socket in which the mast is stepped when sail is hoisted. This socket, hʉksʊ'b, is a carven block of alder wood, 4 inches wide by 8 inches long, thin toward the edges and thick in the center. In its upper surface a pit is carved which accommodates the foot of the mast. The block is fastened lengthwise in the bottom of the boat with cedar pegs. The canoe curve is supplied with bottom-boards of cedar (Lʌt-tsi'b = "covering," a word applied to mats or anything used to cover an object). They are carefully smoothed and rounded to fit the shape of the boat, and furthermore are "crowned up" toward their middle part, so that whatever water comes aboard drains off of them. Between the end of one plank and the end of the next one, a space is left to permit of bailing the boat. The bailer is an ingeniously shaped object, to be described on a later page.

It will be seen by looking at the figure that the thwarts or "seats" are round poles. Blankets and mats are used to pad these poles to form seats. The Indian kneels to paddle, however. The canoes made on the northern coast are provided with flat benches. I am not informed why the Makah and their immedate neighbors elect to employ poles instead of benches. Makah canoes at the present time are often

fitted with ribs, and the seats made of plank, and the small canoes often have tholepins or metal oarlocks.

Care of the Hull

The outside of the hull is carefully charred over with lighted cedar splints. This is done when the canoe is first made in order to preserve the wood from decay. The process is repeated from time to time, and the canoe rubbed with a wisp of grass, or cedar twigs, to clear the bottom of the fouling of barnacles and seaweed which accumulate there (Swan, p. 37).

These matters are described by Boas in the following terms:

"When the canoe is made ready for the hunting season, its outer side is dried carefully, so that all the small splints turn outward. These are burned off with torches, which are afterwards moved once more slowly over the whole surface of the canoe until a layer of charcoal shows on the outside. Then the canoe is turned over and allowed to cool. When it is cold, it is rubbed down [with an old mat, according to another passage] at right angles to the grain of the wood. When it is quite smooth, the outside up to the water-line is smeared with tallow. Olachen-oil is not used for this purpose, on account of its odor. After this the bottom of the canoe is struck with spruce-branches to give it a good smell.

The canoe must never rest on the ground; otherwise its bottom becomes roughened. It is always carried, never pushed along over stones. It must rest so high that a person can sit under the bow, and lift it on his shoulder. The hunter carries in his canoe two round cedar-sticks, about 10 cm. in diameter and a meter long. When a landing is made during ebb-tide, the stern is brought ashore first. The poles are then placed under the canoe to protect the bottom from the pebbles of the beach." (Boas, p. 500.)

Ornamentation

Mention has just been made of the fact that the prow is carved in such a form as to suggest the head of an animal (see above, p. 15). Curtis remarks that this resemblance is accidental; and my own inquiry pointed to the same conclusion. That is, my informant stated that while this carving is considered necessary by tribal custom, it does not "mean anything." This is remarkable, because the form given the prow is far too lifelike to be the result of anything but design. Moreover, the neighboring tribes to the east and north of the Makah have a highly developed totemic art. Carvings representing animals play a great part in their lives. Figures representing animals are invariably present on their canoes, lending the craft a very picturesque appearance. It seems altogether likely, then, that this carving on the Makah canoe was, in origin, totemic. If so, its significance is not recognized at the present day. The Makah canoe, compared to that of the Kwakiutl, or the Haida, is very plain, and almost devoid of external ornamentation. Whatever artistic interest it has, results principally from beauty of design, and careful workmanship.

In addition to the black coloring material consisting of "fish-oil" and charcoal, mentioned by Swan, an evil-smelling black muck, obtained in swamps, is sometimes used. It is called kak'i'tsbɪs (cf. sΔkw'a'kubɪs = dirt, earth). The fish-oil (olachen-oil? dogfish oil?) mentioned by Swan is in some cases replaced by decayed salmon

roe (a′tc'pab). The "Indian red" (red ochre) is called Lɪxtcɛ′t°bɪs. The combination dries very quickly. The charcoal used in painting is called tɪbɪ′sbɪs. The best kind is obtained by burning alder. White clay, tL'si′bΔs, is occasionally used in making designs, sometimes on canoes.

SAILS AND RIGGING

Features of the rigging described by other writers

Sails—The primitive sail is of the "square" type (Swan, p. 38) and is made of cedar-bark matting (Swan, p. 38; Boas, p. 446). It is attached top and bottom to yards consisting of light cedar poles (Swan, p. 38). These mats are woven on a woof of cedar-bark twine. At the top and bottom of the mat these war-strings are made into an openwork border, which permit the sail to be easily attached to the yard (Boas, p. 391).

Among the Kwakiutl sails were made also of thin boards, sewed together (Boas, p. 446).

Rigging—This consists of a mast, two yards, a "hallyard" to pull up the sail, the "sheets" and "braces" (Boas, p. 446; Swan, figure 20) which are attached to each corner of the sail.

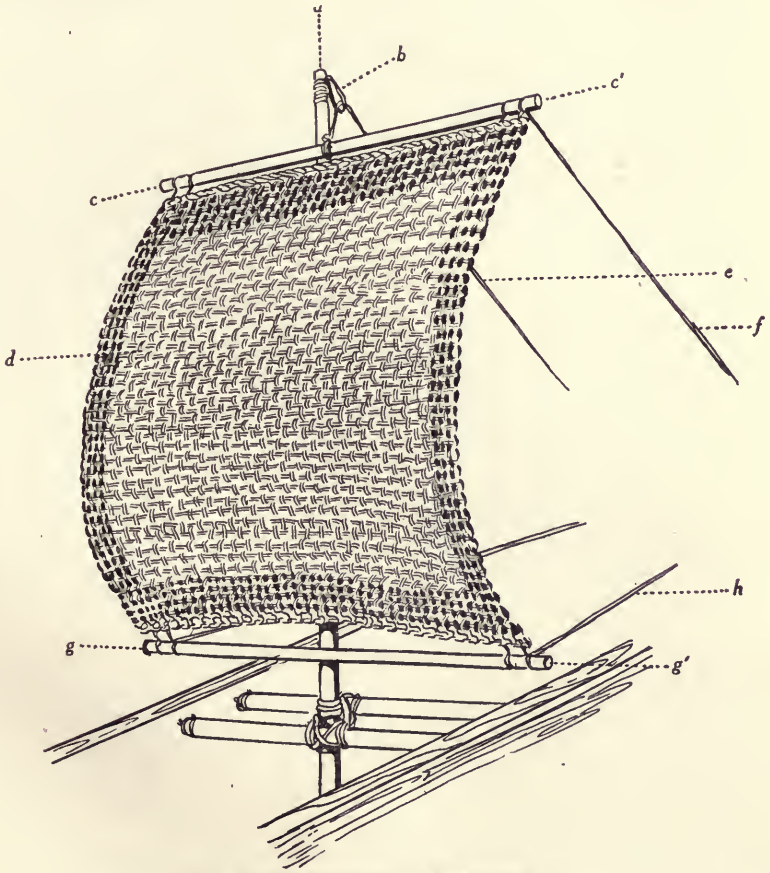


FIG. 8—Sail and rigging of a Makah canoe.

a. mast, tLaxsʊb.
b, noose at masthead.
c,c′, upper yard, tLuc′*a*xtub (<tLucak=a rod: hideaxtɪL=over the top).
d, sail of matting, Ltsa′p‘iy*a*k (<Li′ts∆k = to spread: hidap = up).
e, halyard, tci′apɪLtL*e*k (<tci′apɪL = to pull up).
f, "brace," tci-tc*a*bub (<tci = to pull: ihi′t′*a*buL = the top corner of the human ear).
g,g′, lower yard, tLusa′baktLɪb (<tLusak′ = rod: hit∆ksabaktL = the bottom edge of a mat, or other fabric).
h, "sheet," tci-ksaba′ktLɪyek (= pulling on the bottom of a mat).

ADDITIONAL NOTES ON RIGGING

The sail is an oblong mat (Curtis; chíbat) of a type already described and figured by Boas (1909, p. 383, figures 74, 75; 1916, p. 52, figure 9). A specimen in the University of Washington Museum consists of a mat, three feet and one inch wide by five feet seven inches long, with a pole or "yard" at its top and bottom. Boas remarks that only coarse mats and large baskets are made in this checkerboard weave, a twilled tecnique apparently being employed for the finer pieces.

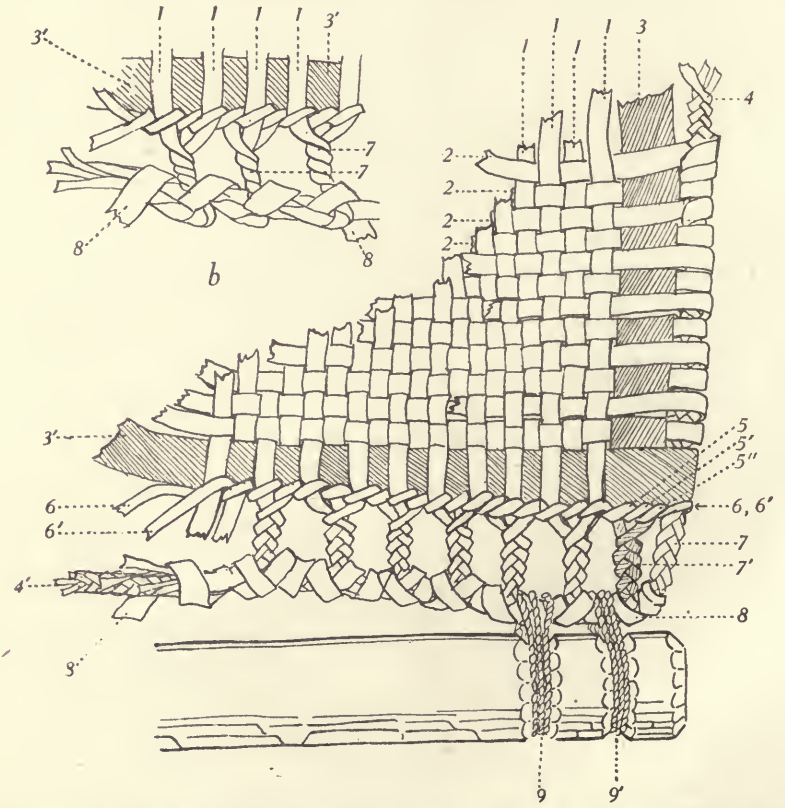


FIG. 9—Diagram illustrating the weave employed in a sail of cedar-bark matting: *a,* The border where the sail is attached to the yard; *b,* Section from the middle part of the lower border. University of Washington, State Museum, Catalog Number 209 (Makah tribe). Diameter of yard: 1⅛ inches (2.7 cm.); width of elements, ½ cm.

1, 1, 1, 1. Warp elements.

2, 2, 2, 2. Woof elements.

3, 3′. Broad ribbon-like strips of cedar-bark, 1 cm. wide, dyed black, and worked in along the edges of the mat as an ornamental border.

4, 4′. String or cord of braided cedar-bark, which serves as the foundation of the "edging" which finishes off the sides of the sail. The woof strands numbered 2, 2, 2 pass over the black "ribbon," then around the cord, and the end is fastened down by the next following strand of woof.

The wide ribbon 3′ is separated into three divisions at its terminations, and these divisions are caught separately into this cord, and held fast (5, 5′, 5″).

6, 6′. A single row of plain twining, which binds the warp elements in place at the lower fringe of the mat. Each strip is caught separately in a "turn" of this plain twining.

The vertical ribbon, 3, is also divided into three narrow strips, and each of these strips is caught separately into the row of plain twining, as indicated at 5, 5′, and 5″.

7, 7′ 7″. A three-strand braid, produced by plaiting together three adjacent warp strips, as they emerge below the row of twining. From 20 to 30 rows at each side are finished in this way. Toward the center of the mat, the strips are merely twisted together, some of the elements being split and parted to one side and the other. This braiding and twisting produces the openwork effect.

A strip of cedar-bark, wound spirally around the braid, 4. Apparently in making this border, the maker worked from the right toward the left. Each string is caught under this spiral ribbon; and is then turned over it to the left, where the end is caught under the succeeding coil of the spiral.

9, 9′. Light three-strand string, with which the "clews" or corners of the sail are caught to the yard.

The openwork border resembles in weave the basket border shown in Boas, 1909, figure 84, page 392. The University of Washington specimen seems to be specially designed for a sail, being finished off in one way at the upper and lower borders, and in another tecnique at the sides. Its construction is shown in figure 9. The mat figured by Boas as a typical specimen has three black elements worked into the fabric, parallel to the border, producing a sort of band of checkerboard ornamentation around the edge of the mat. The present specimen has four similar rows of this black and white ornamentation, beside a wide ribbon of black, which is inserted just inside the border.

The sailing equipment of the Makah canoe is very primitive. The mast is a simple pole, which is inserted in the socket already described, and lashed upright between the two forward thwarts. There are no stays to hold it in place, the mast holding up through the rigidity of the wood. It is hardly more than a stick, since the sail is very small, and the strain is not at all heavy. A noose made of a cedar withe is lashed to the top of the pole. Through this is rove a line of twisted sea-lion gut. This line is called bΔqw'Δtsi'dɪbɛ·k (<bΔqw'ɪ'ts = string) or simply tsi'kyub, "gut". It served as a halyard for hoisting the sail. Sometimes this noose is replaced by

a hole made in the mast itself. At top and bottom the warp threads project beyond the fabric in the form of loops. Through these loops a round stick or rod might be inserted to serve as a "yard." In the specimen examined by myself (Fig. 9) the sail is attached to the pard by extra lashing. The sail is of a square type, and the only additional rigging required beyond the halyard for pulling up the sail are "sheets" attached at the lower corners, and "braces" attached at the upper corners of the sali, to manage it in the breeze.

Captain Cook writing in 1778 says that sails are not aboriginal in this region. The Indians of today look upon their sails and rigging as their own invention.

DEFECTS OF THE CANOE

The canoe is not designed for a sailing craft, and so its design from that standpoint is very defective. Progress by tacking is impossible, as the boat would make more leeway than headway. When a breeze comes over the stern they hoist sail. When there is no favorable breeze, they stow the mast and sail, and paddle. They have no words for "tacking" or "wearing" or other nautical maneuvers. The worst weakness of the canoe is a structural one — namely, a tendency to split (see Boas, p. 446). A canoe may split open into two halves if roughly handled, especially if it is driven vigorously into a cross sea. When hauled up on the beach, it is carefully covered from the effects of the sun, which starts "checking" and splitting, and may in a few hours ruin a good boat. This covering may consist of mats, blankets, boards or branches (Boas, p. 446; Curtis, Vol. 10, p. 16). These are the points in which the Indian canoe is inferior to the white man's boats. For buoyancy and easy riding of the waves in stormy weather, it compares favorably with any craft in the world. In cleverness of design and adaptation to its special purpose, and for artistic grace, it may almost be called a triumph of workmanship.

PADDLES

Information contained in previous accounts

Material—The paddle is made of yew or maple (Curtis, Vol. 9, p. 61; Swan, p. 38; Boas, 1909, p. 496). The cross-piece at the top is made of "red pine" (Boas, p. 497). [Alder, according to my information concerning the Makah practice; cf. Curtis, Vol. 11, p. 179].

Design—The blade is thin and somewhat elastic, and often sharply pointed or "lanceolate." The sharper types are said to make less noise when entering the water (Boas, 1909, p. 496). The top of the paddle ends in a dowell, which fits into a short cross-piece, four finger-widths long. The hole which receives this dowell is made rectangular, and the cross-piece is carefully fitted on the shaft (Boas, 1909, p. 498). This cross-piece is sometimes made of alder (Curtis, Vol. 11, p. 179).

Staining—The paddle is carefully smoothed and polished, and blackened by charring (Swan, p. 38). According to Boas, the Kwakiutl greased the implement

with perch-oil, and blackened it by burning with piece of pitch wood (Boas, 1909, p. 498). This black color never comes off.

Additional notes on the paddle

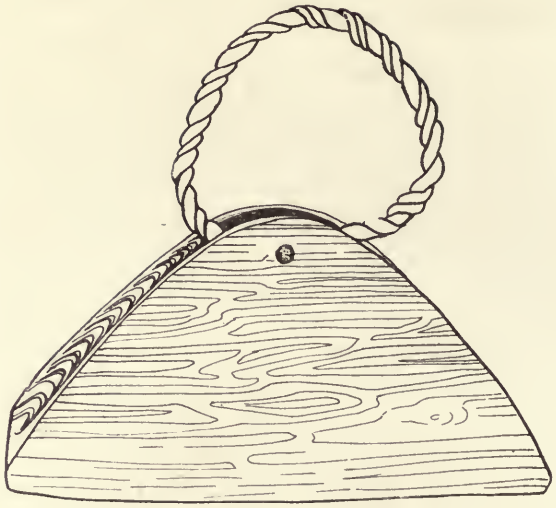
The paddle, kla-táh-juk in Swan's orthography (1870, p. 95), hlatáwachuk in Curtis (Vol. 11, p. 179) is a very well-designed implement. The proper length for a paddle is the distance from the owner's chin to the ground. The paddles used in hunting had more slender and delicate blades than those used in paddling the freight canoe.

My informant describes a somewhat different method of blackening the paddle from that referred to on the preceding page. There are certain growths on hemlock bark which supply a rich coloring matter. These growths are spoken of as "blisters" and are due to the growth of a fungus. These blisters, tc'i'tʋbʋ, are cut out and dried. In making a paint or "stain" they are pounded up and mixed with urine and boiled over the fire. The mixture is used exactly as we use a commercial stain for woodwork. The paddle is painted a solid color. When stained the paddle is held in the smoke until it becomes a glossy black. In this respect Makah paddles differ from the paddles of the north coast, which are painted with striking totemic designs, in red and black.

The middle part of the shaft is not stained, because it is later wrapped evenly with kelp-stem. This material is used for fish-lines, and is very tough. This wrapping of kelp gives a very satisfactory hand-hold.

THE CANOE-BAILER

An important article in the Makah canoe is the wooden bailer, xutcΔ'k. Several types of bailers are in use on the Northwest Coast, some of them quite ingenious. Boas figures several wooden specimens, of the general appearance of dippers or scoops, and one made of cedar-bark (Boas, 1909, p. 446). The Makah use only one type, and this is a type which, as far as I know, has not been described. Its general appearance is shown in Fig. 10, *a*. The use for which it is intended would hardly be suspected from its appearance, in the first sketch. It is pyramidal in shape, hollowed from a single block of maple or alder, qwΔxsa'bΔp. Cedar is too soft for the purpose for which the object is intended; it would wear out very quickly. The ends of the utensil are somewhat concave when viewed from the outside, and concavity deepens into a crease at the apex of the bailer. Two holes are bored transversely (Fig. 10, *b*) through the sides of this channel, and a cedar peg driven through. This peg serves to fasten a loop or hoop made of two cedar twigs twined together and bound with string of nettle fiber. The loop forms a convenient handle by which the utensil may be carried. The Indian often puts the handle of his paddle through this loop, or may carry several bailers at once, strung on the shaft of his paddle. The loop also serves as handle by which the bailer is clutched in scooping the water out of a boat (Fig. 10, *c*). The fact that the loop is seated



a

b

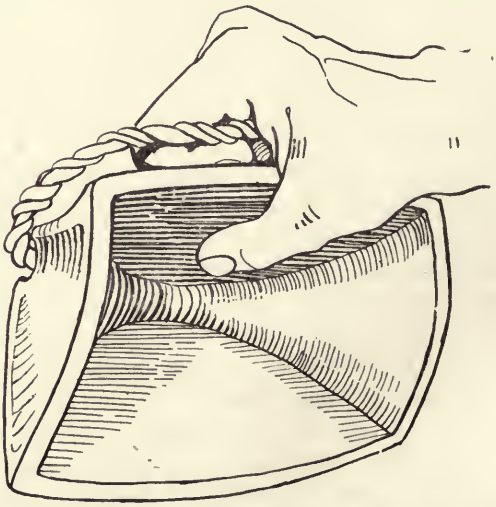


Fig. 10—Canoe-bailer of alderwood. University of Washington, State Museum, Catalog Number 73. Length, 8 inches (20.5 cm.): *a*, the bailer; *b*, attachment of the loop-handle, viewed from above; *c*, diagram showing how the bailer is clutched when in use.

in the bottom of the crease prevents it from being worn in two through scraping the sides and bottom of the boat.

A more effective utensil than this bailer could scarcely be devised. A person can with one scoop of this instrument throw over a much larger amount of water than the utensil itself contains; for it fits closely against the curve of the boat, and a quantity of water is "pushed ahead" of it. A boat can be cleared in half the time that would be occupied in bailing with a can or a tin kettle. The instrument is cleverly designed; and in this simple utensil one observes the same merging of lines, and the same effect of compactness and unity, that can be noticed in the forty-foot canoe. The bailer is colored a smooth, deep red, inside and out, by the use of "hemlock" paint, as described above. The use of this type of bailer seems to be characteristic of the Makah.

THE WHALING HARPOON AND ITS ACCESSORY DEVICES

The complete harpooning apparatus consists of the harpoon-shaft; the harpoon head (itself made up of numerous parts); a lanyard; floats; various sections of harpoon line, to which the floats are attached; and lines for towing the quarry home.

THE HARPOON-SHAFT

Information contained in previous accounts

The harpoon-shaft is composed of two carefully selected pieces of yew, scarfed together at the middle of the instrument. The end of each section is cut diagonally, and the two sloping surfaces are matched, fitted together, and bound with braided cord of cedar-bark fiber. The reason for using two pieces of yew was not known to Edward Curtis, nor to Swan. The underlying cause may be that it is difficult to find one clear piece of the proper length, this length varying from fourteen to eighteen feet in different weapons (Curtis, Vol. 11, p. 16; Swan, p. 20).

The shaft tapers to a point at each end.

Additional notes on the harpoon-shaft

Very particular care is taken with the manufacture of the harpoon-shaft, dupu′ yɛq (du-poi-ak, in Swan's orthography, 1870, p. 21). Its dimensions vary according to circumstances. Swan gives the length as 18 feet. A Makah specimen examined by myself (University of Washington State Museum, catalogue number 213) measured only 13 feet 6 inches. The University of Washington specimen consists, as is invariably the case, of two independent sections, neatly scarfed together in the middle. My informant was sure that there is a *practical* reason for making the shaft in two parts; though he could not remember what the reason was. This scarf (tsΔ′t·as; cf. tsΔtsΔ′t'cyax = points where fore shafts, etc., detach) begins five feet from the head of the shaft. The two oblique surfaces which make the joint, are exquisitely smoothed, and fitted. Each surface is about nine inches long. A white man would hardly attempt to make this joint "hold," but the Indian wraps it very carefully with braided cedar-bark (tsi.c′sy), and the whole is rigid when done. On the University of Washington specimen the scarf had begun to loosen

from age or the drying out of the wood. Cedar-bark string is used because it does not loosen when wet, as sinew or seal-gut would do. The string is braided instead of twisted, so that it will be flat on the shaft, and take better hold. On top of this braided sling is a wrapping of wild-cherry bark. This serving of bark around the scarf gives an excellent hold for the left hand of the harpooner.

At another point the shaft is wrapped for about nine inches, to afford a "grip" to the harpooner's right hand. This wrapping also consists of braided cedar-bark, covered with a spiral wrapping of cherry-bark. The two "hand-grips" are separated by a space of 27 inches.

The tip of the harpoon is channeled out along one side (see Fig. 11). The sinew lanyard which leads back from the harpoon head to the float just fits into this groove.

FIG. 11—Tip of harpoon shaft, showing the groove into which fits the lanyard leading back from the harpoon-head. University of Washington, Catalog Number 213. Length of groove, 12 inches (31 cm).

The harpoon-shaft becomes warped very easily and has to be very carefully straightened before each hunt.

The Indian straightens an 18-foot harpoon-shaft exactly as he does a 28-inch arrow-shaft, by heating it and carefully wrenching it back to "true." He wraps the shaft with big-leaved kelp, and holds it over the fire. When warm and steaming and thoroughly heated through, he straightens it over his knee.

The Indian usually tries to get for his harpoon-shaft a piece of material that will carry with it "good luck" in whale-hunting. The material itself is yew, tL'ixa'ktLbΔp (tL'i'xuk=red; u'bΔp=kind, species), and is carefully selected. Swan gives an account of a pillar-like rock with a cavity near its top which stands in the sea near Cape Flattery. In this cavity there rested in his day a great spar. The Indians, according to Swan, looked upon this spar with veneration, and believed that anybody attempting to dislodge it would fall off the crag and be drowned. A photograph of this rock is shown in Plate 3. The spar, by the time the photograph was taken, had decayed and fallen to pieces. My informant says that many an Indian tried in former years to get this spar for a harpoon-shaft, believing that its unusual situation indicated that there was "power" in it. No one was willing to ask for help in reaching it, because secrecy, as mentioned above, was an essential feature in all preparations for whaling, and so the spar stayed there till it rotted.

THE HARPOON-HEAD

Information contained in previous accounts

The harpoon-head is made up of several elements cunningly joined together. The foundation consists of a pair of pointed barbs, made of elk-antler or bone, which fit neatly together (Curtis, Vol. 11, p. 16; Swan, pp. 19, 39). The end of the whale-sinew lanyard is attached by unlaying the strands and making them fast around the barbs; and then winding the whole with cord and strips of cherry-bark.

A socket is fashioned in the rear of the head, into which the point of the wooden harpoon-shaft exactly fits. The blade, or cutting edge, was formerly made of a large mussel-shell (Curtis, Vol. 9, p. 66), but in recent years of copper, or steel saw-blade (Swan, pp. 19, 39). This blade, whatever the material, is cut into the shape shown in Fig. 12, and inserted between two barbs, the ends of which are cut away to accommodate it. A "fat" knot of spruce is set in front of a fire, and the gum which melts out is caught in a shell. This gum is kneaded and spread smoothly over the harpoon-head. [Boas, 1909, p. 488, says "the point of the salmon spear is gummed over to make it smooth and prevent it from tearing the fish". The spreading of gum over the harpoon-head may in similar fashion tend to make it smooth, so that it may cut its way deeper when the quarry is struck.]

Additional notes on the harpoon-head.

The finished harpoon-head is a very neat and tidy union of a number of separate elements. The word for the device, considered as a finished product is qwi''kapL (<kwɪ'ktcu=to sharpen by grinding). Swan (1870, pp. 20, 21) gives kwe-kaptl, kwe-kwahptl. The harpoon-head most familiar to students who frequent museums is the Eskimo type, carved from a block of ivory, provided with barbs, a crack or socket for the reception of the cutting blade, and a perforation for the attachment of the harpoon-line, all in one piece. The most striking peculiarity of the Makah specimens is that they consist of two separate halves of antler or bone, cunningly joined by binding with string. The reason for the difference is, I presume, that the Eskimo harpoon has in the first place a smaller head, and in the second place walrus ivory is available from which the head may be wrought. The Makah have no ivory, and the pieces of bone or antler which they employ are not large enough to permit the carving out of a solid head. They are in a sense compelled to piece their device together in two sections. The harpoon-heads of this whole region, even to the salmon gigs, are made on this same plan, by binding two elements together. Such porpoise and salmon harpoons are described by Boas (1909, pp. 489-495, figures 156, 157). The porpoise harpoon which Professor Boas figures however, has riveting in place of lashings to hold the two segments of the head together.

The method of assembling the parts of the whaling head is shown in a general way in Swan's work, especially in his figure 4. The details may be seen in the drawings appended herewith (figure 12; and also Plate 8, *c* and *d*.) The separate parts of the head are shown in drawings *a* and *b*, figure 12, with the complete head below.

I am not certain about the purpose of the external wrappings of cherry-bark found in this device, and the coating of spruce gum. The gum may be primarily for the purpose of glossing over the string wrappings, and making the head smooth. This is indicated by Boas' account (1909, p 488). Smoothness would decrease the resistance, as the head is driven into the quarry, and enable the huntsman to plant the weapon much more deeply. It was very important to wound the animal as severely as possible at the first thrust, for this made the consequent fight much

shorter. With luck a harpooner could at the first blow drive his weapon into the huge bulk of the whale clear to the lungs. The intention in applying the wrappings and the gum may also have been to exclude the water. The lines on shipboard which are subject to immersion, are carefully wrapped with canvas and covered with pitch ("parcelled, served and pitched"). This makes them last five times as long. In the present case, excluding the water was even more important, because sinew lashings become loosened and "give" when wet. The cherry-bark lashings are very smooth and glossy, and inasmuch as several feet, or several yards of the lanyard follow the head into the tissues of the animal, the lessening of friction is undoubtedly important.

A word about mussel-shell harpoon blades may not be out of place. When the fact is recalled that the entire central part of the blade was cut out, to enable it to fit over the lashings of the head, it seems that the mussel-shell blade must have proven a very weak and fragile thing. The material of the shell itself is, of course, extremely brittle. After the blade was firmly gummed in place, the gum was cleaned away from the edges, and these were thoroughly sharpened. Brittle material often shows astonishing penetrating powers, when driven with a sharp impact. Flint, for example, makes a very effective tip for arrows. Dr. Saxton Pope, at the University of California, found by experiment that the obsidian-tipped arrow would penetrate further into animal tissue than a steel-tipped arrow would. The reason he ascribes for this fact is that the flint head, being serrated, cuts a way and clears an opening for the shaft, better than the thin steel blade does. I dare say the mussel-shell harpoon blade inflicted a deeper wound on the whole than the more modern steel blade which has replaced it, even though the shell blade may often have been shattered in the process. The shattering in such material does not come until after the impact is completed, and the wound inflicted. In other words the inflicting of the wound is almost instantaneous, while the shattering of the head, if it does shatter requires an instant or two of time. This accounts for the fact that a delicate flint-arrow-point can be driven into a thick buffalo skull, or vertebra, as set forth by Wilson[9]. It must be remembered that the *blade* of the harpoon has no part in holding the animal. This is entirely the function of the bone barbs. The sinew lanyard is most painstakingly attached to these devices of bone, for any failure in the coherence of these elements means the loss of the quarry. The coating of spruce gum, on the other hand, is all that holds the blade in its place. The blade is thus attached with only sufficient firmness to make certain that it will not come loose as the harpoon is brandished. It will, of course, stand shocks of all degrees, as long as they are directed from the front, until it flies to pieces from impact.

The harpoon head is kept in a sheath made of a rectangular piece of cedar bark. This is folded over across its middle. The ends are frayed out for several inches, and fine shreds of cedar-bark are worked across in plain twining (called tc^{a}ıba'tyu, cf. tci'bat,=canoe-mat). Several harpoon heads are taken along on each trip, each one enclosed in a separate sheath. The collection of heads is kept in a special

[9] 1901, pp. 513-521 Moorehead, in his "Stone Age in North America (Vol. 1, pp. 112-121, figure 80, 81), quotes Wilson's paper at some length, and reproduces two photographs of skulls, one human and the other bison, with delicate flint points driven into them.

basket, called ha'³aL (Plate 5). This bag or basket is of checkerwork, and has a flaring top. The basket in which ordinary fishing tackle is kept, is made in the same weave, but is rectangular in shape, without the flaring upper portion.

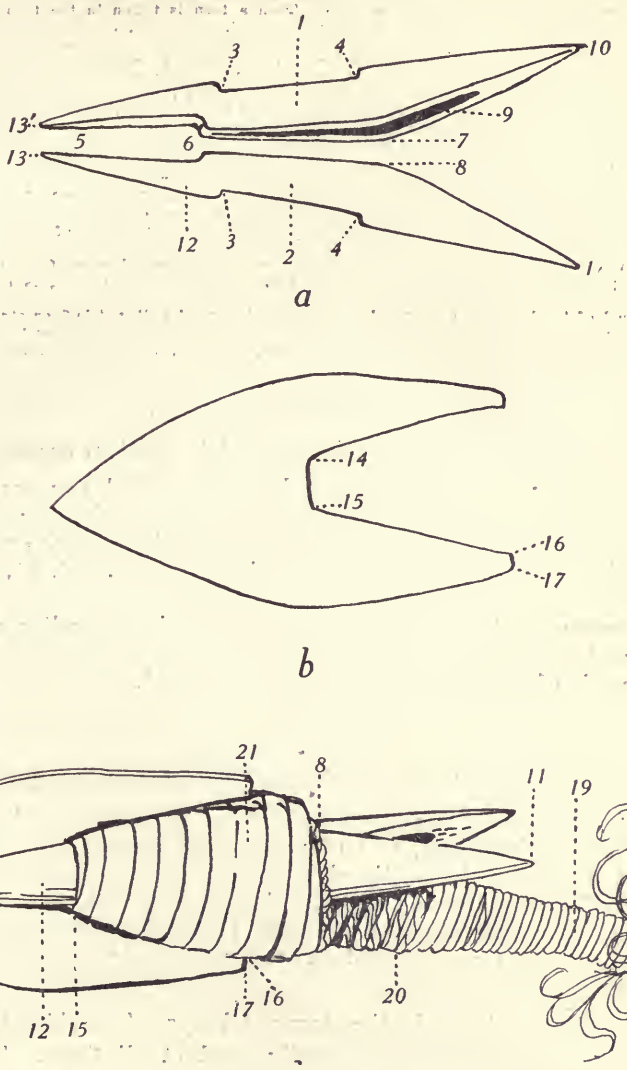


FIG. 12—Diagram showing the assembling of the parts of the whaling harpoon-head: *a*, the complete head; *b*, the cutting edge of mussel-shell or metal; *c*, the bone hafts or barbs.

NOMENCLATURE

Element	*Swan*	*Present Informant*
Barbs (*a, 1, 2*)	tsa-kwat (p. 21)	ts'a'kwΔt (= antler)
Blade (*b*)	kut-so-wit	.....
Lanyard (*c, 18*)	kluks-ko	Lu'ksku
Cherry-bark (*c, 21*)	.....	tLexa'paL
Spruce gum	.....	IΔk'ɪ'tubc

METHOD OF ASSEMBLING PARTS

The hafts (1 and 2) are brought together along the line 6-7. A wide groove, 3-4, extending around these hafts, serves to hold in place a wrapping of sinew strands. These strands are derived from the sinew lanyard, the end of which is "unlayed" and the separate elements fitted over the hafts. These strands are first wound around the pair of hafts as around a spool. Then a turn is taken in the transverse direction between the two hafts, forming what a seaman would call a "seizing". A socket, 5-6, between the forward ends of the barbs, is for the reception of the blade, *b*. From the points indicated by the numbers 7 and 8, the hafts are caused to diverge. A groove or channel, 9, in one of these hafts, when united with a similar channel in the opposite barb, forms a hole or socket for the reception of the pointed tip of the yew harpoon-shaft. The rear projection of the hafts (10, 11) acts as barbs, to prevent the head from being pulled out of the animal.

Great care is taken with the disposition of the ends of the lanyard, over the harpoon-head. At least one heavy strand is brought through the socket at the point indicated by the number 6 (see also Plate 8), and is worked in an ingenious fashion under the other wrappings. This makes it certain that the lanyard can by no chance pull away from the barbs. When the strands are disposed over the head to the satisfaction of the artificer, the whole head is wound with strips of wildcherry bark (numbered 21 in the diagram).

At this time the blade, *b*, is inserted in the proper socket (5-6). The edge 15-16 fits over the lashings of the head. The edge numbered 14-15 rests against the turn of sinew cord which passes over the point 6. A thin wedge of wood is driven between the surface of the blade and the front tip of the hafting (13, Fig *a* or *c*). The blade is then fastened more securely in place with spruce-gum. A solid coating of the gum is then applied over the whole head, making it very smooth. The gum is scraped away from the edges of the blade, which are very painstakingly sharpened. The surface of this spruce-gum coating is as smooth and glossy as varnish.

The front end of the lanyard, near the harpoon-head, is served with nettle-fiber string (*c*, 19). Beginning at the point 18, the nettle-string wrapping is replaced by a continuous wrapping or "parceling" of wild-cherry bark, which covers its entire length. In some specimens, however, the serving of nettle-fiber string goes the entire length of the lanyard.

THE WHALING LANYARD

Notes on the lanyard contained in previous accounts

The lanyard is a strong rope of whale sinew, an inch or more in diameter, very carefully and smoothly laid, served with string made of nettle fiber, and covered with a continuous spiral wrapping of strips of wild-cherry bark or nettle-fiber string. The free end is worked very neatly into a loop (Curtis, Vol. 11, p. 16; Swan, pp. 19, 20, 39).

The Vancouver Island tribes make such lanyards of sea-lion gut, split, cleaned, and dried, and rolled into a hard round cord. These cords are wrapped spirally with string made of nettle-fiber (Curtis, Vol. 9, p. 54).

BUOYS OR FLOATS

Features of the buoy or sealskin float described by other writers

Buoys made of sealskin are attached to the harpoon line. They have the purpose of retarding the whale, and of making the carcass float after the animal's death. Such a float consists of the skin of a hair-seal, turned with the hair inward, made water-tight, and inflated (Curtis, Vol. 11, pp. 31, 33, 35; Swan, p. 20). The valve for inflatation (according to one author) is at the left flipper (Curtis, Vol. 11, p. 33). These floats are painted in various simple patters with red ochre (Swan p.30).

The male hair-seal supply the strongest buoys. The skins can be obtained at any season of the year, and are equally good at all times. The hide or pelt, tuqwΔ'k, is stripped from the animal with as little cutting as possible. The head and front flippers are cut away and the body encircled about halfway down its length. The skin from the front half of the animal is then "peeled off" in a forward direction, turning the hide inside out. This skin is then carefully scraped to get the "grease" off. Well scraped skins last better and are more pliable. After the scraping, the skin is usually smoked, which turns it a soft brown in color. The holes left by removing the head and flippers of the animal are stopped up in the following way (see figure 13): A plug or spool of wood is inserted in the orifice, and the loose hide carefully "gathered" around it, as smoothly as

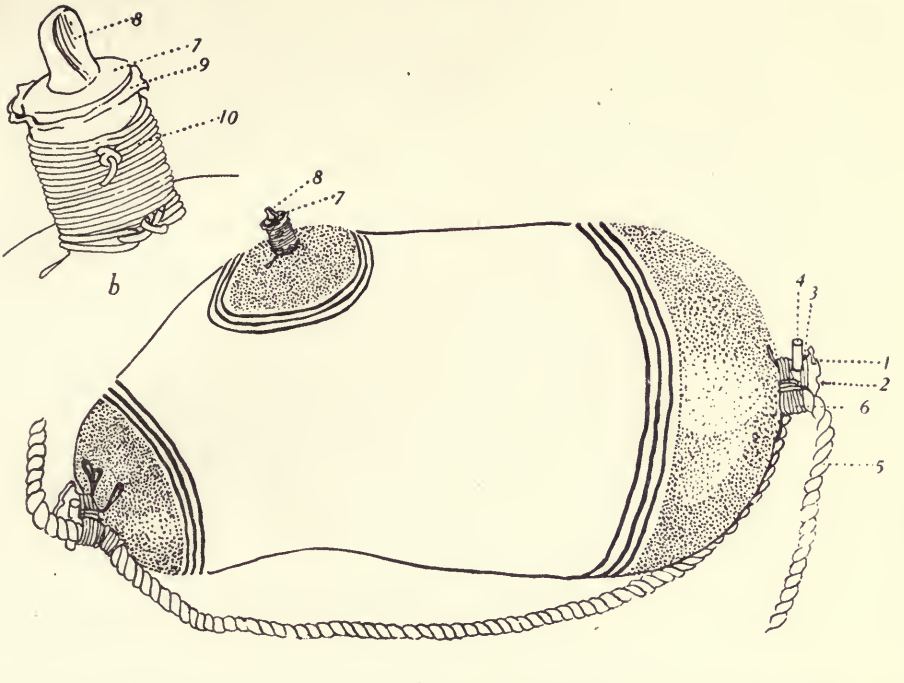


FIG. 13—The float or buoy: *a*, the complete float with its attachments; *b*, detail drawing showing the nipple and plug for inflation. Diameter at widest part, 17 inches (43 cm).

NOMENCLATURE

Lower figure

a. Buoy, tukwa'kap·ιL (= . . . . outside).
1. Folds of hide, hιhιqsΔqso, bunched or gathered around a wooden spool.
2. Wooden spool, atcιska'pub (<atcι'L = something put between other things: "filler").
3. Wrapping of gut string, which binds the folds of hide to the spool.
4. Yew-wood peg or skewer, kvdv'tcskapub (= holding something in place). This prevents the wrapping of gut string from slipping over the spool.
5. Rope of spruce-root, or cedar-fiber.
6. Lashing or serving of sinew string, batLska'pub, attaching the buoy-rope to the buoy.
7. Nipple, or perforated spool, by which the buoy is inflated.
8. Plug or stopper, hvkska'pub (<hvkstcu = to screw in: this stopper fits the opening very tightly, to prevent the buoy from becoming deflated).

Upper figure

7. Nipple.
8. Stopper.
9. Folds of hide.
10. Wrappiing of gut string, which fastens the hide to the spool.

possible. These folds are then fastened down to the spool by winding with gut string. A peg or skewer is then thrust transversely through the folds of hide, to prevent this wrapping from slipping over the spool. The plug at one of the front flippers is perforated down its axis. This opening serves for the inflation of the float. When filled with air, the hole is stoppered with a small wooden plug or "cork" of yew wood. Accidental leaks in the buoy, such as those made by the hunter in killing the animal, are stopped by plugging with a piece of rope. Such a mend or patch is called q'a'tstcu (q'a'tsɑ̈tL,=to make a difficult patch, or repair). A cedar or spruce-root line is attached to the buoy, being strongly lashed at either end to it with sinew. The free ends of this rope serve to attach the buoy to the whaling line. As is usual with Makah lines, the ends are reduced in size. tapering down at their tips. This makes the line easier to tie, but must apparently reduce its strength. These buoys are kept in a flattened condition. Before being used, they are soaked in water, and inflated. This work is done when on the whaling grounds (see below).

The principal features of the ornamentation of seal-skin buoys can be seen in the figure. The areas where the head and flippers once were are colored solid with red ochre, Lɑxtɛ'hɑbɑs, mixed with rotten salmon roe, a'tcpab. These areas are surrounded with several concentric circles. In addition to these simple ornamented areas, figures are sometimes added to represent the thunder-bird, LukLu'tc, or the "lightning animal, "xexe'tu'k; the latter a creature having the shape of a snake, striped transversely with black and white, who travels through the air. These designs are not totemic, but are intended in some mysterious way to make the buoy more deadly to the whale.

The pursuit of the hair-seal whose hides supplied the buoys was itself an occupation not devoid of excitement. The two pronged harpoon used for this purpose, and for porpoise hunting, and the method of handling the canoe, are described in detail by Boas (1909, pp. 488-495; 500-504, 506) and need not be gone into here. The Makah used also to waylay the seal at their "haul-up" places. They could sometimes kill a seal at 75 feet, by hurling the harpoon, though they usually cast at a distance of 30 feet. Sometimes a big bull when harpooned would show fight, and threaten to tear a canoe to pieces. In that case, they bent a buoy onto the harpoon line and let it go, picking the quarry up after he had died of his wounds. They usually carried one or more buoys in a canoe for this purpose and to use as life-preservers in case of a capsize.

Swan (p. 30.) tells of deep caverns in the cliffs, in which the seals congregate. He says briefly that the Indians go in with a torch and kill numbers by clubbing them. The actual procedure has some picturesque features. There are ten or more of these caverns in the vicinity of Cape Flattery, including some on Tatoosh Island, and certain of them are of enormous dimensions, extending into the bowels of the Cape for some hundreds of yards. A cliff containing several of these caves may be seen in Plate 30. The hunter tied his hair (which was formerly worn long) in a knot on the top of his head. This knot was firmly wrapped with sinew, and a skewer run through to keep the wrapping from slipping off. Into this knot of hair

long splints of spruce pitch-wood (duqwi'ets) were thrust, so that they stood up vertically. The best pitch-wood was selected for this purpose, dried, and split into fine pieces. These "lights" or splints were two feet long. When this apparatus was securely in place on his head, the hunter took his sealing club, lighted the splints at the top, lowered himself into the sea, and swam into the cave. The light of the burning splints blinded and stupified the seals, and enabled the hunter to club them easily. When he had killed five or six, he tied them together, took the ends of the thong in his teeth, and towing his kill behind him, swam out again.

A number of years ago a hunter went with a companion to certain sea cave which has a very small opening, a sort of oblique slit, very narrow and difficult to get through. When he was well inside, the surf put his light out, leaving him in inky blackness. There was a tremendous and incessant swishing of waves in the darkness on every side, and the hunter, becoming confused, had no means of knowing which way the entrance lay. The companion in the canoe outside the cave foolishly idled most of the afternoon, waiting for the hunter to appear. Then he was driven away by a sudden squall. The next day it was calm again, and a rescue party went to the cave. A volunteer put on his head the usual outfit of splints, swam far into the depths of the cavern, and there found our hero sitting placidly on a shelf of rock. When his light went out, he "hauled up" like a seal, and with true Indian patience, sat there without light, fire, raiment or food, until help came.

LINES AND ROPES

Boas gives a complete account of the manufacture of the various kinds of ropes and lines (1909, pp. 369-382), including the gathering and preparation of fibres. The manufacture of lines is also referred to by Curtis, (Vol. 9, p. 146; Vol. 11, p. 16) and Swan (p. 21). It may be well to merely enumerate the principle varieties. The stem of the kelp is dried and used for fish-lines. String of nettle fibre is sometimes used for the same purpose. The harpoon lanyard is manufactured from whale sinew, wound or served with nettle-fibre string, and covered with a wrapping of cherry-bark. These lanyards are beautiful examples of workmanship. Fine lines, which are, however, very strong, are made from sea-lion intestine (called tskikyu'p by the Makah), which is split and rolled into a string. These lines are used just as they are for many purposes, for example, for bow strings, and for the halyards of the canoe sail. Ropes consisting of a number of strands of this material are sometimes manufactured. Bear-guts are sometimes used in a similar way Curtis mentions a rope of gut, twisted spirally with nettle-fibre string, as being made on Vancouver Island. Lines are made of seal-skin and elk-hide. The hide is cut spirally in a long narrow strip, and this strip rolled or twisted into a thong. Such thongs can be used as they are, or twisted or plaited into heavier lines. Bark fibres are somtimes made into ropes. The heavy lines, such as are used in whaling tackle, consist either of spruce-root fibres, or slender cedar withes. Very long cedar twigs somewhat thicker than a pencil are cut from the tree, being very carefully selected. The bark is removed,

and by heating, twisting and working, the fibres are separated until the twig is practically as soft and pliable as rope. These withes are then ready for use, for example, in fastening the thwarts in a canoe as described above (page 21). In this condition, they are stronger than hemp rope, and five times as durable. They were also woven into excellent large ropes, which were very smoothly and evenly laid in three strands. These various kinds of lines are used in different ways in the whaling tackle, largely depending upon the supply of each that is available. Towing us usually done with elk-hide ropes, but if lots of line is needed, cedar is used to piece out.

THE WHALE HUNT

The hunting of the whale has for the white observer two distinct aspects. From our point of view the matter of greatest concern would be the arrangement of the tackle within the boat, and the methods of approaching and striking the quarry. From the Indian standpoint, however, the really important matter is the proper observance before and during the hunt of various cermonial performances for procuring help from the spirits. The Indians, to be sure, see with the very greatest care to all practical matters connected with whaling expeditions, but they seem to look upon the religious performances as much more essential to success. Secrecy in the religious preparations is very commonly observed. Curtis in his volume on the Nootka gives a great deal of information about whale hunting. Quite an elaborate account of a whaling expedition, an account which describes both the ceremonialism and the operations of killing and disposing of the quarry, will be found in the same volume, pp. 19-34. This passage is the story of a Nootka hero Umik and his successor. Swan gives some information, very briefly. We may discuss first the ceremonies, the outstanding features of which may be summarized as follows.

Religious observances connected with whate-hunting as described by other authors.

Help from the spirits. Possession of a "medicine," or power of a spiritual nature, is necessary before a man can sucessfully captain a whaling canoe (Curtis, Vol. 9, p. 9; Vol. 11, p. 16).

Bathing. This is a most necessary part of the preparation for a hunt. The seeker after "power" goes early every morning to a freshwater lake or pond. Entering the water at dawn, he sits down until the skin is "soaked" well. Then he stands up and rubs himself with bunches of hemlock twigs, about one span in length, beginning the operation on the left side of his body. When the needles are worn off of one bunch, and the bare twigs covered with blood, he wades ashore, takes a second bunch, and rubs his right side. He continues this until the four bunches with which he has provided himself are all used up, (Curtis, Vol. 11, p. 20).

Imitating the whale. After rubbing, the candidate dives down, staying under as long as possible. Mention is made of blood bursting from a bather's ears from long submergence. He does this four times, and on emerging each time, he blows a mouthful of water toward the center of the lake, trying to make a sound resembling the blowing of the whale (Curtis, Vol. 11, p. 20).

His movements are always quiet, and slow; "so that the whale will act in the same way" (Curtis, Vol. 11, p. 25). [The point is that otherwise the whale, when struck, may thresh about and knock the canoe to fragments, or may set off at high speed and tow the party twenty miles to sea.]

When a whaler's wife is helping him at his devotions, she sometimes holds the end of a rope which is tied about his waist [representing the harpoon line.] In this condition he sings whaling songs, and walks around her, with the slow undulating movements of the whale, the woman repeating over and over again, "This is the way the whale will act!" (Curtis, Vol. 11, p. 38).

Mention is made by Curtis of a performance by a whaler, in which he stands erect in a pond, shaking a rattle, and holding his left hand out with the thumb sticking up "like the fin of a whale" (Vol. 11, p. 37).

Prayers. Whalers pray at night in whispers for success. Mention is made of "Four Chiefs," to whom they pray (Curtis, Vol. 11, p. 28). They are also reported to beg the sun for success. [The present writer's informant insists that they direct their prayers to Daylight, tL'ɪsi'xaq, not to the sun; the word for sun being tL'ɪsi'xa'pɪL]. They also pray directly to the whales, both in the preparation-period, and after the animal is struck by the harpoon. The following prayer of a Clayquot bather deserves to be quoted at length. It is given in Curtis' volume on the Nootka (Vol. 11, p. 37).

"Whale, I want you to come near me, so that I will get hold of your heart and deceive it, so that I will have strong legs and not be trembling and excited when the whale comes and I spear him. Whale, you must not run out to sea when I spear you. Whale if I spear you, I want my spear to strike your heart. Harpoon, when I use you, I want you to go to the heart of the whale. Whale, when I spear at you and miss you, I want you to take hold of my spear with your hands. Whale, do not break my canoe, for I am going to do good to you. I am going to put eagle-down and cedar bark in your back."

After the whale is struck, songs are sung to make him "come along" easily. "When the whale is weak and going ashore, he likes to hear the whaler sing," (Curtis, Vol. 11, p. 37). These songs themselves are in the nature of prayers. The following is an example: "It is good for you to go quickly toward the shore, so that the young men may see you quickly, for they all wish to see you." (Nootka song, Curtis, Vol. 11, p. 32). Series consisting of one hundred "towing songs" are mentioned.

The following prayer is utteered, according to Curtis, after a whale is harpooned: "Whale, I have given you what you wish to get—my good harpoon. And now you have it. Please hold it with your strong hands. Do not let go. Whale, turn toward the fine beach of Yahksis, and you will be proud to see the young men come down on the fine sandy beach of my village at Yahksis to see you; and the young men will say to one another: 'What a great whale he is! What a fat whale he is! What a strong whale he is!' And you, whale, will be proud of all that you will hear them say of your greatness. Whale, do not turn outward, but hug the shore, and tow me to the beach of my village of Yahksis, for when you come ashore there, young men will cover your great body with bluebill duck feathers, and with the down of the great eagle, the chief of all birds; for this is what you are wishing, and this is what you are trying to find from one end of the world to the other, every day you are traveling and spouting." (Vol. 11, p. 23).

Use of Skeletons and Corpses. All sources of information mention a curious practice of using skeletons, or skulls, or corpses, during the ceremonial bathing. One of Curtis' Quilliute whalers used to take a skull from a burial place, tie it on

a rope about his waist, and then swim about, "sounding" and "blowing" like a whale. That was why he was successful, taking over forty whales in all, (Vol. 9, p. 147). In some cases skeletons from grave boxes are "joined up" and suspended somewhere in the woods. Prayers are directed to them, and they are carried on the whaler's back as he bathes. The arms of the skeleton are tied together behind its head, and the whaler puts his head through the arms, getting the cadaver on his back (Curtis, Vol. 11, p. 25). Then he swims about in the pond, diving and spouting.

In former times, fresh corpses were used in this way (Curtis, Vol. 11, pp. 103-110). The body must be that of a male, dead not more than four days. Occasionally a small boy could be killed for the purpose. Sometimes the corpse was skinned, by cutting along the front of the body and the inside of the hips, the whaler diving with the skin tied on his own body (Curtis, Vol. 11, p. 39). When a corpse was used, the lower part of the legs and the forearms were cut off. A pad of rose-bushes and nettles was put on the whaler's back, and the body was placed upon that pad, the back of the corpse against the whaler's back. One time a man put a corpse on his back in preparation for bathing, face forward, and it took a death grip on his throat, and killed him. When visiting a grave-box to get a dead body, the whaler walked with an undulating movement (Curtis, Vol. 11, p. 39).

Taboos. Whalers are very careful in observing taboo in connection with women. It is best to avoid any kind of contact or association with women, for some of them might be ceremonially unclean (Curtis, Vol. 11, p. 23). The whaler's wife helps him with his vigils, but the two sleep in separate places, and avoid all mention or thought of sex matters (Curtis, Vol. 11, p. 34). The woman bathes, as does her husband, spouting like a whale, sometimes with a skeleton on her back. At the time when the whaler embarks for the hunt, the woman lies down with a new mat over her, and does not move, or eat, or drink, until her husband returns (Curtis, Vol. 11, p. 35). The whaler himself never eats whale meat, lest he have difficulty in killing more whales (Curtis, Vol. 11, p. 18).

Ceremonial Dress. The whaler and his wife wear a head dress of split feathers and ornaments resembling thee "saddle" of the whale (Curtis, Vol. 11, pp. 38, 39. These head-feathers and some other decorations are shown in Curtis' photographs, Vol. 11, pp. 20, 22, 28, Folio, Plate 382, 395). When putting to sea in charge of his boat, the whaler wears hemlock twigs on his forehead, and a bear-skin robe (Curtis, Vol. 11, pp. 9, 30). Whalers tie their hair in a sort of knot or club at the back of the head (Swan, p. 17).

Astronomical considerations connected with whale-hunting. Whalers observe the phases of the moon, in connection with their preparatory observances. All through the winter they bathe when the moon is waxing (Curtis, Vol. 9, p. 145). They start on their expedition when they see the first new moon "in the month of May" (Curtis, Vol. 11, p. 44). In connection with the feasts accompanying a successful hunt, mention is made of gull feathers being stuck into the "saddle" or "hump" of the whale, to represent the moon, in the phase it presents at the moment (Curtis, Vol. 11, p. 40). The supernatural power usually comes to a man "with the changing year." [That is, the winter solstice: direct observation by sighting past a tree or a boulder is relied upon for ascertaining the occurrence of this phenomenom (Curtis, Vol. 9, p. 145)].

Dreams. Dreams play a part in the whaler's life. According to my informant, a man in bathing often scrubs himself with some plant about which he had dreamed; seaweed, for example. As mentioned by Curtis (Vol. 9, p. 145) the whalers wait for a vision of getting a whale, and then start on their expedition.

ARRANGEMENT OF EQUIPMENT FOR WHALING.

Curtis in volume 11, p. 17 of his work, gives a brief description of whaling methods. I have been able to find no complete account of the actual pursuit of the whale, so the matter may perhaps be gone into here. The stowing of the complicated equipment in the canoe involves a very high technique. We may consider this matter first. Mention has already been made of the "spaces" into which the canoe is divided by the thwarts. These spaces are apportioned for the different operations of the hunt. They are indicated in the accompanying diagram (Figure 14).

The most important man in the whaling canoe is the harpooner. He is the leader of the party, and captains the expedition. His native title is γ'u'tax, hunter or searcher. His position is in the bow of the boat, where he takes his stand with his weapon. The harpoon itself is sixteen feet long, and carries on its point the bone-barbed harpoon-head, which is edged with mussel shell (see page 32 above for a description of the weapon). To the harpoon is attached about four fathoms of tough sinew rope, with a noose at the end. The space at the bow where the hunter stands is kept clear of everything so that the chief performer shall not be hampered in handling his weapon. Things "happen" very quickly when the whale is struck, and any confusion of the tackle, or a momentary fouling, may mean the loss of the whale, or the capsizing of the boat. The man in the next adjoining space abaft the hunter's position, on the port side, has as his single duty the prompt "bending on" of a buoy together with eight or ten fathoms of heavy cedar rope. All of this tackle is tied by means of a reef-knot (t'a'bᵘqcL) to a loop at the end of a sinew leader. As the whale goes down, after being struck, one section of line after another is bent to the first one. Sealskin floats, qwɪso':tΔs(c cf.qwɪso'·tL ,= bladder), also are attached by special knots, at intervals of two fathoms. The whale is always harpooned from the right hand or port side of the boat, and it is the duty of the men seated along this side to help clear this tackle and get it overboard. No "ties" or knots are made between different sections of the gear, until each new section is safely over the side and clear of the boat. The whale takes the line out very rapidly at first, and if the tackle were joined up *in* the boat, any delay in getting it over the side would cause the boat to be jerked under water, or would cause a capsize. In addition to the harpoon and its complete outfit of floats and lines, the boat carries a sort of bone-pointed lance (butu'ysk) some four or five feet long, for use in dispatching the whale at close quarters, bailers (xutcΔ'k), wooden boxes (tcΔ'xsγb) of drinking water, a large number of extra floats, towing lines of elk-hide, cedar rope (tla'cuk), and food for the crew for at least two days. All of this equipment takes up room. The stowing of the apparatus so that it can be gotten out easily and rapidly and at the same time not interfere with the crew, is a highly developed art. Each pair of paddlers sit on the upturned end of a canoe-mat, tc'i'b'at, (=something put under one) which is laid down on the flooring, turned up behind the thwart, and folded forward so as to cover it. Thus the mat serves to cushion the seat, and also serves the purpose of preventing the tackle in that particular compartment from working astern and getting mixed up with other parts of the equipment, or interfering with the bailing of the canoe.

THE PURSUIT OF THE WHALE.

It is the Indian belief that a "run" of whales occurs during a certain season of the year, corresponding to the run of salmon, or halibut. The species called sixwa'ox or "sore faces" (see below) are the first to run, migrating northward. The whalers used to put off from shore at sunset, in a spell of whaling weather, so as to get on the whaling grounds at daybreak. They usually encountered whales travelling northward along the coast. The various kinds of whales they recognize are as follows:

California grey whale, *Rachianectes glaucus,* called by Swan che-che-wid. This is the kind most frequently taken.

Sperm whale, called by Swan kots-ke, meaning, according to my infromation, "having something upon the head". There are several species of these, including the cachalot (*Rhyseter macrocephalus*) and the saw-toothed whale (*Ziphius carrostris*), which my informant does not distinguish one from the other.

Right whale (*Balaenoptera artifera?*), called itc'γ'p "old one" (Swan gives yakh'-yo-bad-di, not explained).

....Humpback whale (*Megaptera veisibilis*), called sixwa'ox, or "sore faces" (<si'xwi=sore). This variety is said to be similar to the right whale in proportions, and "runs" in the spring. The oil obtained from them is reddish.

Finback whale (*Balaenoptera davidsoni or B. vilifera*), called ka'owad, "sticking up in the middle" (<ka"ap=protruding: apa'owΔd=in the middle).

Sulphur-bottom whale (*Balaenoptera sulfurea*), called kwaqwawe'axtLi, "noisy tail" (Swan gives kwa-kwau-yak-t'hle, not explained).

Killerwhale, or "blackfish" (*Orca*), called klasqo'kapɪx (<klaska'pɪL=smooth; -ɪL, generic).

When on the ground where whales might be expected, the seal-skin floats, which after soaking to make them soft, have been packed into the canoe in a flattened condition, are gotten out and inflated. The harpooner, takes his stand in the bow with his sixteen foot weapon, its barbed head, to which is attached the sinew lanyard, in readiness at its tip. The lanyard is "caught" to the shaft in several places with cedar bark lashing, which breaks very easily. He usually plants his right foot firmly at a point forward of the bow seat, and rests his left foot on a pair of short braces at the stem of the boat. This posture is called yɛtsa'wad (<yɛ'tscɪt =to kick). In this position, closely scanning the water ahead of him, he repeats a prayer. It is sometimes very hard to find whales, and to come up with them. At other times no trouble of any kind is experienced. It all depends, say the Indians, on the bathing a man has done. The whale when seen by the Indian is usually following a school of small fish. Coming up for breath, he rolls forward under water and disappears from sight, a moment later appearing again and "blowing." His motion is regular, and deliberate. The canoe cuts across his course and "lays" for him. When it seems possible to meet him in one dash, the steersman, tLɪtc·a', gives to the crew the word "hatsLtsatL" (come on!"). This steersman is usually an elderly man, with a great deal of experience. The idea is to run up along side of the whale as he emerges, so that he is to the right of the canoe. Combined luck and skill are required to bring the canoe sharply alongside of the quarry, and there is

usually not an instant to spare. When close to the whale the starboard man on the forward seat, spoken of as the kaqai'yuwaxs (from his position in the forward "space") has the right to give the word c^{+}v', ("now throw!"). The hunter is more or less guided by the judgement of the men behind him, all of whom have their eyes on the quarry. Sometimes the canoe runs fairly upon the animal as he emerges, the harpooneer striking him from a distance of six feet.

In brandishing his weapon, the harpooneer keeps his weight well forward on his feet, to insure steadiness. He swings the harpoon up over his head, turning his body towards the right side, the palms of both hands, in which he grasps the shaft, turned *outward*. This does not seem to be the natural position for a lunge, until it is tried, experimentally. This posture as a matter of fact gives much greater power, control, and freedom of effort, and enables the hunter to strike downward with all his might, and yet recover his balance quickly. This latter is a very essential point. Old Anderson, of Neah Bay, nichnamed dɛ'cyk ("strong"), once, in trying to regain his balance after striking a whale, stepped on a coil of the harpoon-line and got his foot entangled in it. The next moment he was twitched off his feet and pulled overboard, a bight of line around his ankle. A stricken whale when he "sounds," is sometimes gone for fifteen minutes, and when Anderson's friends saw him go down with the whale they thought he would certainly be drowned. He managed to get a grip on the line, however, and disengaged his foot, and came up blowing. He lived to harpoon many a whale after this adventure.

The best time to strike the whale is just as his head becomes submerged, as he "turns over" preparatory to going down. If struck while his tail is in the air, he is likely to knock the canoe into bits. Quite commonly a whale when struck flirts water over the boat until it is completely hidden from spectators, and filled half full. One switch of the tail, if it "lands", has been known to knock the bow off a canoe, and split it open from stem to stern. The inflated buoys in case of such a catastrophe are very convenient to hang to, until something can be done with the boat. Cases have been known, in which whale hunters caught in such an evil case, threw a line over the boat so as to draw the pieces together, then put some floats under the gunwales to buoy the boat up, and finally caulked the seam with a piece of shirt, and paddled home, after bailing out.

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The moment the whale is struck, the man behind the harpooner throws over a float, instantly. In the interval of a second or two, he bends this float to the harpoon line. Meanwhile the other members of the crew back water with all their might, to get clear of their huge quarry. As he "sounds" and takes out the line, additional floats are bent on, new lines being added as the quarry goes into the depths. As many as thirteen floats may be attached to one line. The sections of line last added are lighter, since there is less strain upon them. Last of all a small buoy is added to serve as a "marker," attached by a very light cord. This buoy remains near the surface, and when the whale starts upward from his long submergence, it bobs quickly to the surface, long before the whale himself appears. The canoe races forward to that point, ready to plant another harpoon. Meanwhile, signals are made to any other canoe in the vicinity, that the quarry has been struck. One

of the crew stands up and calls "hya⁺o" and sticks up a blanket on a pole. The successful hunter promises the other crew some certain definite part of the animal, for example, the tongue, for their help in killing the game. Every harpoon that is struck into the whale carries a buoy, and as the number of these buoys increases the drag on the animal's progress is soon very serious. A wounded whale who has been struck a number of times, often cannot get more than six feet below the surface, hampered as he is by these buoyant floats. However, the huge animal if often extraordinarily tenacious of life, and what turns out to be a weary fight for the tired canoemen, continues for hours. An old Indian, bʊts'ɛ'kxa, nicknamed Santa Ana, once volunteered to ride a badly wounded whale. He clung fast to the lines, and dispatched the cetacean with a butcher-knife, by means of repeated hacking. When the whale "sounded" he clung fast and "went under" with him, stabbing him meanwhile as best he could. The Makah used to practice diving and holding the breath so as to be prepared for emergencies.

The actual arrangement of the tackle attached to the harpoon-head seems to have differed somewhat with different tribes. Curtis gives the following notes on the succession of elements in the long string of tackle.

Quilliute tribe (Vol. 9, p. 146)

1. Harpoon head
2. 4 fathoms of sinew line
3. Float
4. 10 fathoms of cedar line
5. Float
6. 30 fathoms of line
7. Float
8. 50 fathoms of line
9. Float

Nootka tribe (Vol. 11, p. 16)

1. Harpoon head
2. 4 fathoms of sinew line
3. Float
4. 8 fathoms of 1½ inch plaited cedar line
5. Float
6. 20 fathoms of ¾ inch line
7. Float
8. 30 fathoms of ½ inch line
9. Float

After the whale is dead, a certain member of the crew, the "diver," goes down as described by Curtis, and fastens a small line to the creature's lower jaw. This is then passed through the whale's upper lip, and made fast to the tow line. Pulling on this line jams the whale's lower jaw against the upper one and in this way his mouth is kept closed. They say that when the mouth is closed the body does not become water-logged and is towed more easily.

When the whale is newly killed some difficulty is experienced in keeping him afloat. The animal drowns, of course; that is, the lungs fill with water; and he tends to sink outright. He often disappears below the surface, being sustained only by the floats (see Plate 4). Upwards of twenty such floats are required for that purpose. These are attached separately to harpoon heads, and stuck into the head of the carcass. If the floats are too few in number, the whale is correspondingly deeper in the water.

DISPOSITION OF THE WHALE-CARCASS

All authorities mention the cutting up of the whale, and refer to rules by which it was done. As far as I can discover the details are as follows. The whale, when towed ashore, is measured from blow-hole to hump. The unit consists of the distance the hunter can reach, from tip to tip of his fingers. The measurement, from blow-hole to hump establishes the size of the whale. Then the proper width for the "cuts" of blubber is computed. The cutting up of the whale is shown in figure 15. The "hump" is the richest in oil, and belongs to the hunter. According to Curtis, he sells it or gives it away, being afraid to eat it (see p. 40). The hump is called yu'b-Δtsk,=taboo-piece, (Swan's u'butsk, not explained) and is treated in a very ceremonious manner, described by Swan very fully, the main point being that it is set up on a sort of rack and left there for a considerable time, being decorated meantime with eagle down, and feathers, (see above, p. 39). This "saddle" is removed first of all. It is of the width already determined as being proper in the light of the size of the whole carcass. A strip extending clear around the animal at the point 5, (Fig 15), is next taken off. This belongs to the canoe which brought the first assistance. The lower jaw, 8, goes to this party, and often the tongue also. There are rules for the dividing of this tongue among the crew, the hunter or harpooner getting the largest piece. The material is not eaten, but the oil, which it contains in large quantities, is extracted from it. The flipper, lulΔ'pι ("hand") is eaten, and is often named in calling for assistance in the hunt. On the under side of the whale is an area covered with long creases, three or four inches deep. This is spoken of as the tsa-bΔ'kΔk ("strips"), and is often "promised away" beforehand. After the awards for assistance in the hunt are all made, the hunter gives away the remainder of the carcass as he thinks fit. He himself keeps the tail (Curtis, Vol. 11, p. 37). There is some blubber on the flukes (see 7, b) and the remainder is of a jelly-like consistency, like pigs-feet, when cooked. This distribution is the act so very characteristic of the northwestern Indians; that is, the cutting up of the whale and the distribution of the blubber is a form of potlatch. The donor knows to a pound what everybody receives, and expects a return at a future date. The meat of the whale is not removed, but the blubber (tL'a'bas) is highly valued. This blubber is cut with the short bone-pointed lance, butu'yek, mentioned above. It consists of a straight handle 4 or 5 feet long, with a chisel, butkaiya':p, of elk-antler. A hand-hold, su"Δts (=something one holds to) is cut in the top of the strip, and a line is made fast. As one man wields the chopper, another pulls the blubber away with the line, tci'ktup. Plate 6, *a*, shows this operation. The hand-hold also serves in carrying the blubber (see Plate 6, *b*), The oil extracted from this blubber is highly valued as a dressing for dried fish, and berry-cakes. After the oil is all extracted, the blubber itself is dried and eaten, having a pleasant taste, suggesting rich pork, though somewhat tougher. The dried blubber looks like citron, according to Swan. The skin of the whale is very thin, almost like paper, and has no value to the Indian. Under the skin are perpendicular fibres, called tLi'dits, about ¼ inch in diameter. (See Plate 5, *a*). These are very rich in fat, and are removed and eaten raw, or

boiled. They are quite palatable in their raw state, and children especially are said to be fond of them.

There are many disagreeable features connected with the cutting up of the whale, which other authors seemed to have passed over without mention. I presume they are a necessary part of the account, however, if a true picture of the primitive food-quest is to be presented. They may be mentioned briefly. The stomach of the animal when he is killed usually contains from one to two tons of half-digested fish. This material begins to decay almost at once, and the carcass soon begins to be bloated, from the gases which accumulate. If two days are consumed in getting to the land, the tongue begins to protrude, the carcass "floats high" in the water, and the whale stinks desperately. It is the intestines that give rise to this odor, however, not the blubber. Even a perfectly fresh whale stinks when he is opened. It is said that the man who first opens the carcass on the beach is sometimes overcome by the gases, which burst out, and "cause him to faint." The process of decay goes on much more rapidly in the flesh than in the blubber, which keeps for an indefinite period, even if not removed from the whale. The flesh can be removed from the bones only after stripping off the blubber, which requires time. Possibly that is the reason the flesh of the whale is not more generally utilized. Blubber which has become rancid, through overmuch delay, is tried out, and the oil is used for various technological purposes, not for food. The bones, with the muscles and ligaments, are left on the beach for the birds and other scavengers. All of the blubber, however, down to that on the flukes, is carefully preserved.

RELIGIOUS OBSERVANCES CONNECTED WITH BRINGING IN THE WHALE

Formerly the whole village turned out to receive a whale, mostly, however, from excitement, and interest. The whaler's wife came down and danced, and sang. Eagle-down was placed upon the dead animal's hump, and on the blow-hole (Curtis, Vol. 11, p. 36). Menstruant women and adolescent girls were supposed to stay in the house, and not see the whale; otherwise, they would spoil the "luck." Before cutting up the carcass, the songs of the successful hunter were chanted, led by his father or his uncle. Those songs "were like prayers." An old experienced man measured the whale and made the first cut. After the hump or saddle had been cut off and taken to the house, it was set upon a rack and decorated with feathers, as described by Swan (see above p. 45). For several days there were gatherings, and numerous ceremonial performances. The old whalers sat facing the decorated "saddle-piece" and each man sang his own whaling song. (Curtis, Vol. 11, p. 40). The successful hunter often entertained the people by a performance, showing his "power." A helper, with a rattle in the form of a bird, would begin to rattle and sing the whaling songs belonging to his chief. The latter would enter, dressed in ceremonial costume. My informant has seen a man dance completely clothed in nettles, tied on. The performer in such ceremonies makes his entry in time to the music, and dances around the fire in a contra-clockwise direction. His movements imitate those of the whale, and he heaves his way slowly around the fire, "blowing" from time to time. He never stands upright until the circuit is completed.

No religious regard was ever paid to the bones, which were left on the beach. Evidently the courtesies extended to the taboo-piece or saddle, fulfilled all the necessities. The skeleton of the whale lay at low water mark, and was slowly cleaned by water-worms and sand-fleas. The whale, nevertheless, was supposed theoretically to be a guest of the village, and to have appeared upon the scene of his own volition.

METHODS OF NAVIGATION

As already remarked, whaling expeditions often go clear out to sea, out of sight of land. On the high seas at night, the Makah steer by the Pole-star. They never get lost, even in a fog, for they are helped by the swells and the wind. In this part of the Pacific the heave runs pretty consistently west and east. They know by experience also that thick weather comes on when the wind is from the southeast. So if the weather is thick, they conclude that the wind is from that quarter. Clear weather, on the other hand, is usually accompanied by winds from the west. By considering all of these matters, the whalers always manage to get back "somehow."

Some of the older men, who have spent a lifetime on the halibut banks, can locate themselves even when out of sight of land by the appearance of the water and the set of the "tide rips."

The following expressions are used by the Makah canoeman as terms of direction while on the water

To the left or "port", tcΔba′tsp (cf. ka′tspa,=left).
To the right or "starboard", tcΔba′tsa′k (cf. katsaksp,=right).
Ahead, hitΔ′kwΔd-dItsp (cf. hitΔ′kwΔd, the bow space).
Astern, tL'I′tca′tsp (cf. tL'i′tca, the stern space).
The term iyɛxΔxs is used in the sense of "here" or "there," applying only to positions inside of a boat. On land, other terms are employed.

HISTORY OF THE WHALING INDUSTRY

I suppose it would be impossible to discover which of the various coast tribes originated the hunting of the whale. It is certain, however, that it sprang up somewhere along the west coast of Vancouver Island. Probably the Nootka and Clayoquot had as much to do as anybody with developing the industry. The art is not found on the *east* coast of Vancouver Island, nor does it exist among the tribes of Alaska, as the Haida or Tlingit. Whaling is practiced by the Quilliute and Quinault, south of Cape Flattery, but the practice is unknown beyond their territory. Whales are spoken of in the accounts of the tribes living all along the coast of Oregon and Washington, and whale products of various sorts are utilized, as they are also in Alaska, but the tribes who actively pursue the big cetaceans are those in the vicinity of Capt Flattery and Vancouver Island. The Makah, who live near the southern frontier of the region where whaling is practiced, would hardly be looked upon (in the absence of positive proof) as the originators of the practice. All sources agree, however, that they long ago attained first rate skill at it.

About 1860 the Makah temporarily left off whaling. The reason was the enormous profits to be derived at that time from pelagic sealing, at which pursuit also they were highly skillful, and highly successful. About the year 1890 they resumed their whaling practices, largely because by that time the Government protection of the fur seal had reduced the profits of sealing. Many of the Makah tribe attained distinct success as seal poachers, until the Federal Government's increasingly strict supervision of the animals made poaching impractical. Whaling is still carried on at the present time, largely with their old tribal apparatus.

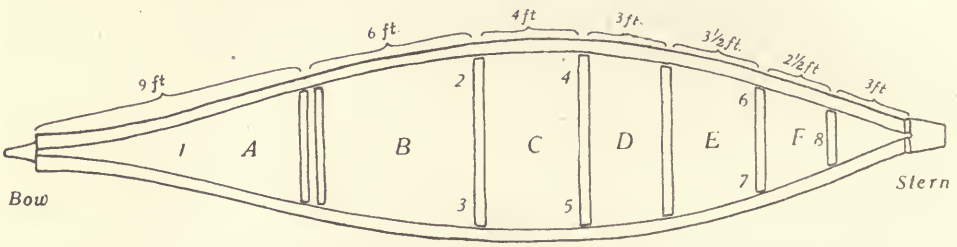

Fig. 14—Diagram showing the arrangement of the huntsmen and their equipment in the whaling canoe. (Based in part on information contained in Curtis, vol. 11, pp. 36, 37, 184). For the native terminology for the thwarts and other parts see figure 3, and uage No. 50, above.

A. Bow-space, hitΔ'kwΔd, occupied by the harpooner with his weapon and four fathoms of sinew line.
1. Position of the harpooner.
B. Second space, kaqai'yuwΔxs, laden with 14 floats.
2. Position of the float tender.
3. Position of the diver.
C. Third space, tcɛLΔkduwΔxs, laden with cedar line, in sections.
4. Position of the harpoon-line tender (chikowihlhasi, in Curtis notation).
5. Position of the float-inflator.
D. Fourth cargo-space. Here the bailing is attended to.
E. Fifth cargo space, hitΔ'kstΔxs (=inside) laden with water-boxes and provisions.
6. Position of the watcher.
7. Position of .....
F. Sixth cargo space, tL'i'tca (=stern).
8. Position of the steersman.

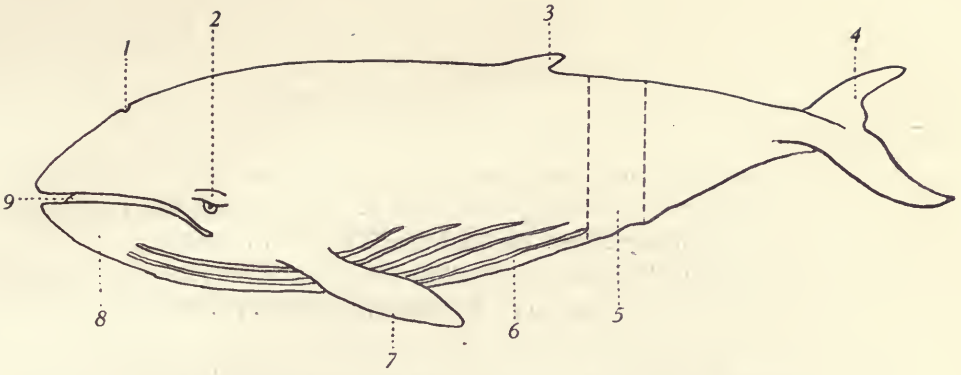

Fig. 15.—Diagram showing the cutting-up of the whale.

1. Blow-hole.
2. Eye, kali'i.
3. Hump, or saddle, yub--'Δtsk (=taboo piece).
4. Flukes, tLɩ'ɩ'ctcid (=feet).
5. Strip extending around the carcass, xΔtsΔ'qΔbɩtL.
6. Creases, tsa·bΔ'kΔk (=strips).
7. Flipper, lulΔ'pɩ (=hand).
9. Tongue, lΔ'k·aiyvk.

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ILLUSTRATIONS

Explanation of Plate 1.

a. Shaping the hull of the canoe. The typical adze used in such work is seen in the carpenter's hand. A stone maul is close at hand on the bow of the boat. The canoe, cut away as it is at bow and stern, is a very heavy-looking hulk until the additional bow-and-stern-pieces are in place.

b. Fitting the bow-piece on the hull. The bow-piece in a partly-finished state, is being hewn to fit a scarf previously cut in the hull.

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MAKING A "CHINOOK" CANOE.

Explanation of Plate 2.

a. The canoe is beached stern-foremost, as is the invariable rule. The scarf which holds the stern-piece on the boat is visible, patched in one place with a piece of tin. The "gunwale strips" can also be plainly seen. One thwart has been broken down, and the "mast-holders" have been replaced by a sawn plank, with an auger-hole in it. Inflated buoys may be seen, and the old whaler is holding a fine harpoon-shaft.

b. This photograph shows a canoe with the old fashioned square rigging, the various halyards being plainly visible. The sail, however, is of canvas instead of matting.

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"LIGHT-HOUSE JOE" WITH HIS HARPOON AND BUOYS.
A CANOE UNDER SAIL.

Explanation of Plate 3.

a. View of Cape Flattery looking north. The isolated crag in the sea has a recess near its summit. This crevice is about 40 feet from the top, and the size of the crag may be further estimated by comparing it with the growth of timber on the nearby cliff. A spar lay in this recess for a great many years (See page 30 above). Flattery Light may be seen in the distance.
Light may be seen in the distance.

b. This photograph shows the same crag as the previous one, but the view is taken toward the south. In the cliff to the left are the sea-caves which were the scene of the sealing exploit mentioned on page 36.

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ALONG THE MAKAH COAST

Explanations of Plate 4.

a. The whale in this photograph has "drowned" and has sunk out of sight. His position is marked by the group of floats in the background.

b. Here the whale has been towed to the beach at Neah Bay. At low tide the people will be able to gather around the stranded carcass, to remove the blubber.

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THE HARPOONED WHALE

Explanation of Plate 5.

a. Basket in which harpoon-heads are carried.

b. An old Makah is here seen peeling the skin from a whale. As remarked in the text, and as may be seen here, this skin is very thin, and quite the opposite from the hide one would look for on such a tremendous carcass. The harpoon-heads and the buoys attached to them have not yet been cut out of the tissue into which they were driven in killing the animal.

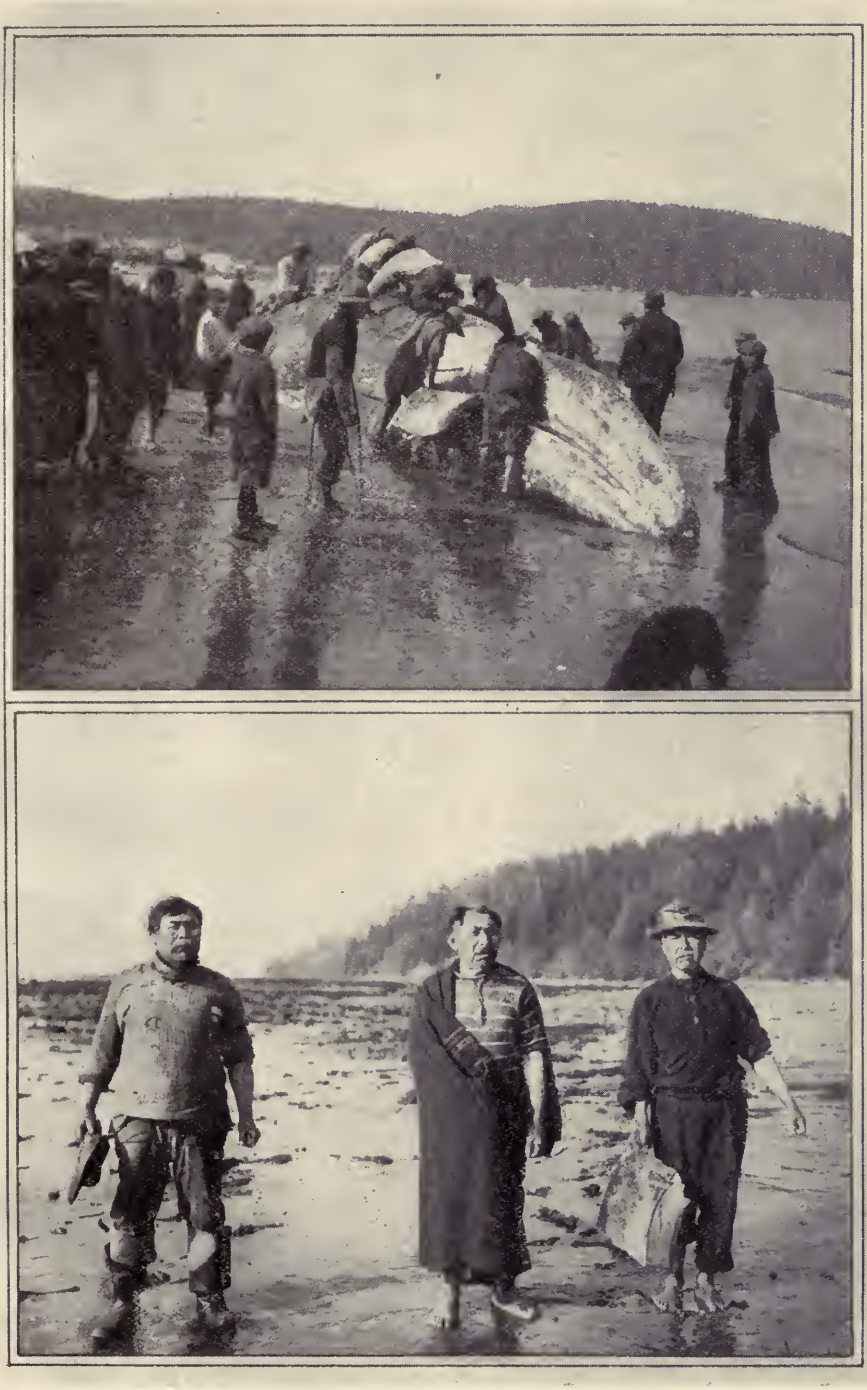
Photograph by F. S. Hall
Photograph by Asahel Curtis

Removing the skin from a whale-carcass; basket for harpoon heads.

Explanation of Plate 6.

a. The blubber is here being removed from the stranded whale. Slabs are cut with the "chisel" or "butu"k," and stripped off by pulling on a line, attached to a slash at the top of the slab.

b. Three famous whalers, Antone Wispu, on the reader's left; David Fischer, or Q'ɛ'ɬt'Δp; and Charley White, called TLɬxwɑt'u, or "Paddler." Charley White is carrying a "cut" of blubber by a hand-hold.



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CUTTING UP THE WHALE

Explanation of Plate 7.

a. The bones of the whale are largely stripped bare of the blubber, several cuts of which are visible in the foreground.

b. The flesh of the animal may here be seen, in the middle part of the carcass, the blubber having been stripped off. In the foreground lies a float, and at the right, one of the great flukes of the tail.

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THE LAST OF THE WHALE

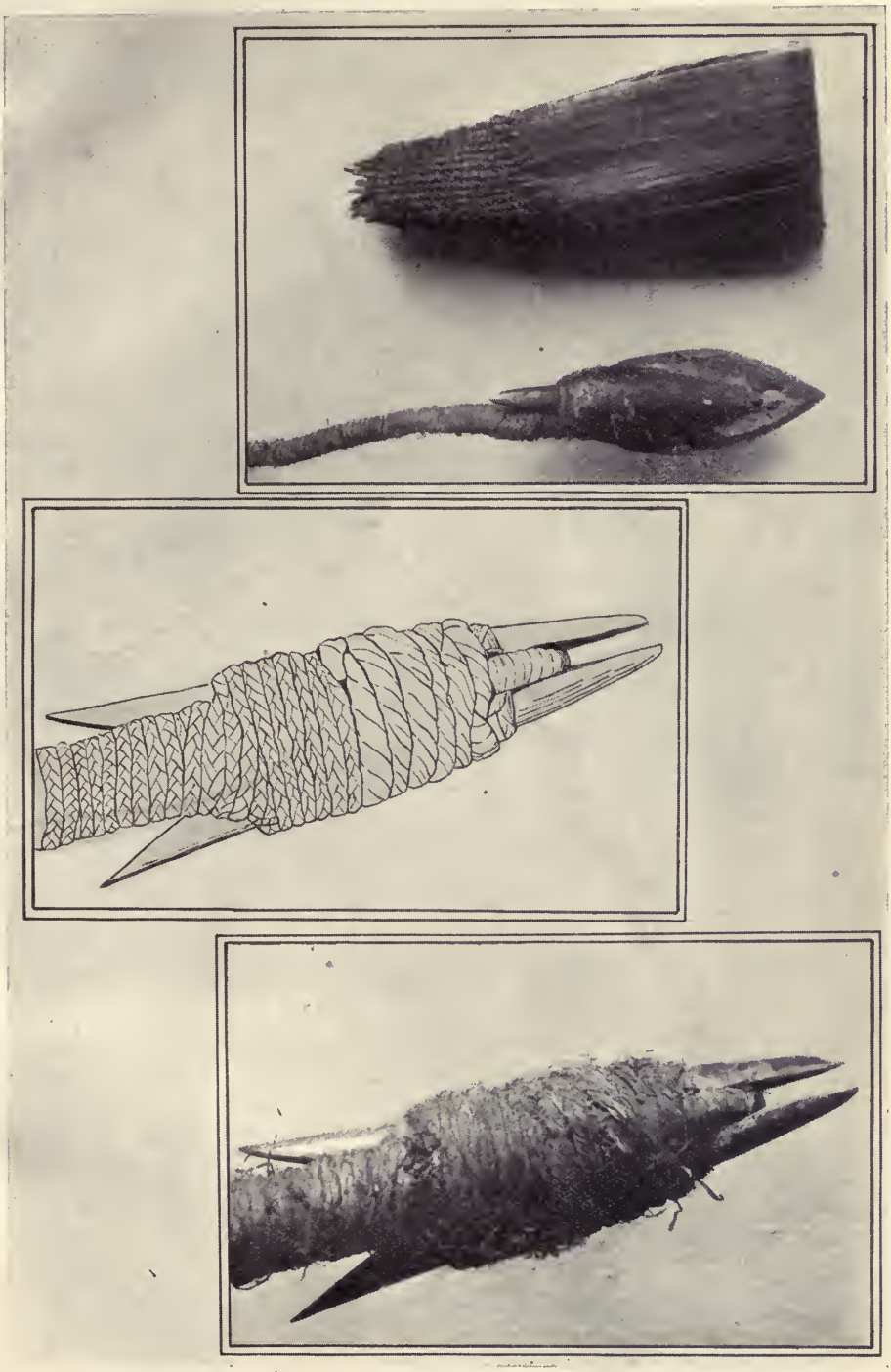
Explanation of Plate 8.

a. Sheath for the protection of the harpoon-head (see page 32). The sheath consists of a folded strip of cedar-bark. The two ends of this strip are split into narrow fibres, and these fibres are worked over with separate fibres of bark in plain twining. University of Washington, State Museum, Catalogue number 105. Length from point of barb to point of blade, 6⅞ inches, 17.5 cm.

b. The complete harpoon-head. The sinew lanyard, the bone barb, the blade (in this specimen, a piece of saw-steel) and the final coating of spruce gum, are all plainly shown. University of Washington, State Museum, Catalog number 105.

c. Sketch showing the details of the above lashing, as far as they are visible in the completed specimen.

d. Enlarged view of a whaling head photographed without the blade, and the covering of resin; showing the ingenious manner in which the strands of the sinew lanyard are wrapped and served around the bone framework. University of Washington, Catalog number 85.



Photographs by Linkletter Studio

HEAD FOR THE WHALING HARPOON